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Pedagogic Achievements of Pestalozzi.

Utterances of PROFESSOR ROSENKRANZ.

Dr. Karl Rosenkranz* in a memorial address delivered at the Pestalozzi centennial January 12, 1846, sums up the debt which modern pedagogy owes to Pestalozzi as follows:

"(1) In the method of instruction he has substituted for the artificial and playful modes of procedure the striving after the cheerful seriousness resulting from, and embodied in, the form of development given by nature herself;

"(2) He has emancipated the government of children from all terrorism. In place of compulsion and lifeless mechanism he has put the most loving treatment of the pupil, in order to habituate him to self-activity and self-esteem;

"(3) He has opened our eyes to the fact that all culture of individual intelligence and all moral elevation of the individual will are vain in the end *if they do not issue forth from out of the whole spirit of a people and do not flow back into it as its original property.* He has taught us to regard education essentially as national education."

Rosenkranz repeats these three points in the following sentence:

"Naturalness of the method in teaching and learning; love as the essential form of all human intercourse, hence also that of educators and pupils; the elaboration of education to a national system—these are the eternal ideas which moved the heart of Pestalozzi, and which for us and all posterity, to be sure, are perfectible *ad infinitum*, but must never be given up."

"It is," Rosenkranz says in another place, "a lasting achievement of Pestalozzi, through method, *to remove all arbitrariness in teaching and learning.* In order to gain a clear knowledge of anything, the human mind must pass through a necessary sequence of *processes.* From sensation and sense-intuition it must rise through ideation to clear concepts. Instruction cannot give true insight if it does not consider this necessary sequence. In this psychological basis Pestalozzi fully agrees with the famous saying of Kant that 'sense-intuitions without concepts are blind; concepts without sense-intuitions, empty.'"

One more quotation from the remarkable address of Rosenkranz:

"Pestalozzi recognized not only the truth taught on every page of universal history that man must be educated; he recognized also that education, no matter how it may be modified, is governed by *eternal laws*, and he clung, therefore, with unshaken consciousness to the necessity of method."

* Born at Magdeburg, April 23, 1805; died at Koenigsberg, 1879. Occupied for forty-six years the chair of philosophy in the University of Koenigsberg. Best known to American students of pedagogy as author of "The Philosophy of Education." (International Education Series, Vol. I.)

A Phase of the Daughter's Education Away from Home.

By ARTHUR GILMAN.

When we speak of the education that we are to give our daughters, we usually have in mind that intellectual cultivation for which, mainly, teachers are carefully trained. We are apt to forget, or, at least, not to emphasize, the other side of the subject which includes social and spiritual nurture. The noble teachers who combine in themselves the two complementary offices of the teacher and the mother are as marked and as rare as they are blessed. If a woman unite in her person the ability to perform both of these functions, she finds herself laboring under a heavy burden, and usually discovers that one portion of her work is performed with less ability than the other. A division of labor results in an economy of intellectual and spiritual energy to the teacher as well as in refreshment to the pupil.

The mother, sending her daughter away from home, knows that a personal culture is wanted which is but incidentally provided for in the pedagogic curriculum. She seeks for her daughter a capacity to admire right things in morals and art; and so far as these admirable things are ways of behaving, the power to embody them in life. Right ways of behaving in great matters we call noble conduct; in small things they are charming manners, and in either sense they are, as the mother sees, worthy of the utmost labor to achieve. The secret of developing a girl's character consists in constantly presenting to her the right persons and things to admire. The fond mother who knows this, may be a paragon; but she feels often a consciousness that it is not in her power to give to her daughter all that she needs. At such moments she longs for a fresh incentive. Where shall she look? She is convinced that girls cannot be cultivated wholesale; they cannot be put into a machine and sent out like polished stones fit for the temple; they are not to be *forced* into lines of conduct; they need freedom, as well as good guidance; they must be handled as carefully as the most delicate lens that Mr. Clark fits for the great telescope that is to be sensitive to the smallest influence of the tiniest ray from the most distant planet.

Shall the mother look to the great boarding-school, or to the confinement of the convent, with all their attractions? She demands quiet, but she also wants something to occupy the busy young mind. The girl must not be restrained too much, lest she become a rebel;

she must not be shut away from life, lest she become morbid. Shall she go to the country? It is dull. Shall she look to the city? It is crowded with life, but it is noisy and full of temptations. The problem is not an easy one to solve, but it has been met and solved in Cambridge, a quiet, suburban town, near enough to Boston to share its life, and quiet enough to make rest possible, while it possesses sufficient activity to keep the girl's mind from stagnation.

It is in connection with The Cambridge School for girls that this is done. There the pupils live in small groups, each of which is under the House-Mother and an assistant, accustomed to the refinements of the best American life, inspired with a firm desire for the highest training, and dominated by elevated ideals, who are capable of surrounding them with the humanizing and cultivating influences to which they have been born and bred under their fathers' roofs. These ladies give the girls a second home; but with the important modification that arises from the fact that while the real home is usually arranged and carried on for the benefit of a mixed household, these are established simply and solely for the benefit of the young girls who are to constitute their sacred charge.

If anything is to be accomplished in any uplifting effort of this kind the germ of admiration must first exist; but when it is present, it may easily be made to increase. Those things which she ought not to emulate, should be sedulously banished from the girl's horizon, and she must be surrounded with proper objects of admiration. Then, by a simple process of repetition, may be developed whatever small germs of capacity for right feeling and right doing the girl may possess; and all wrong things, by banishment from the life, may become more and more strange, until, at last, we can hope to find the power of admiration well-nigh appropriated by good things alone. When such habits for right have been developed, we may dismiss the young girl into the great world with some confidence that they will be retained through life.

Thus we see why high-minded men and women are able to exert power over others, lifting them and broadening them. This gives us the reason why young men thronged to Cambridge to gain inspiration from Agassiz. Perhaps they thought that they came for what Agassiz taught; but that was not all. Though Agassiz was pre eminently a teacher he was sought above all for the inspiration to great endeavor that he gave the students. It was the *man* Agassiz, and not the teacher only, that they thronged about. Let a girl live in the presence of a high-minded and elegant woman and she will feel a like inspiration. She will not alone *admire* the nobility of soul and the high-bred demeanor, but she will gradually embody those traits in her perceptions, and she will practice them in her commerce with the world.

The Residences of the Cambridge School have been founded for the purpose of affording to young women homes which shall be new, without being at the same time those in which they must assume the chief responsibility. Thus a fresh experience is given each girl, so that when she is obliged to act for herself the change will not be so great nor so little prepared for. The House-Mother in these homes is the essential factor. Her duties are simply a continuation of those of the mother—the development of character as distinguished from the storing of the mind. It is she who creates for each girl her spiritual atmosphere; through her the girl's choice of companionship comes; she guides her in her amusements, as well as in her literary and artistic tastes, if she have tendencies in these directions, thoughts both are considered by the teachers also. By her equity and elevation of purpose the House-Mother is the unconscious means of moral and spiritual development; she exerts a direct influence in these matters also; and in her personal dignity and charm of manner she is the pattern to which the girl's social ideas and behavior tend to conform. The House-Mother is a part of the atmosphere with which the girl is surrounded, and she creates all the rest of that atmosphere.

The Residences of the Cambridge School are founded upon the deep distinction which exists in the nature of things between the two necessary parts of a complete womanly training, represented by the conveyance of information on the one hand and the guidance of admiration on the other.

Cambridge, Mass., October, 1896.

A Study in Discipline.

By J. L. Halloway.

It is generally agreed that both the immediate and ultimate aim of education in its final analysis is the development of character. This in the highest sense is will in action, the best self exerting itself along lines of duty. But what is duty? Webster defines it as "That which is due from one person to another, growing out of natural, moral, and legal relations." The social instinct is the basis of all these relations. The child yearns for association constantly. He puts a personality even into his toys, and extracts genuine pleasure from the application to them of his limited notions of social law. Among the earliest things he learns from association is to distinguish between what is involved in the terms "mine" and "yours." This differentiation is the basis for all future training in character building. With proper instruction his conception of the idea of "yours" ultimately develops into higher and higher notions of duty, such as another's due from him of all three of the obligations just enumerated. This involves the abandonment of his early ideas of absolute rights and brings him to helpful and harmonious relations with his fellow where relative rights only hold sway. In these relations he learns to exercise the virtue of self-control, subordinating individual gratifications to the welfare of the universal good; he learns that honesty is the basis of confidence, and pleasant social relations rest on mutual confidence; that society as against vacillation and purposelessness, is the root that nourishes all substantial growth; that work is the inexorable law of development running through all life.

Of course the child never formulates these facts; he never stops to attempt to define duty, or theorize on justice. But his environments bring him into conscious touch with these virtues, and if legitimate direction be given to his impulses and purposes, he at least formulates them into action. And after all it is this dynamic expression of these virtues which all rational teaching must and does seek to develop.

Mere formal instruction in character building is attended with little value. The statement to a guilty boy that cheating is lying, and lying is the beginning of a whole train of evils which culminates in worthless character may or may not awaken sober reflections. The prophetic consequences of wrong-doing are too much enveloped in the mists of the future to bring self-reproach and reformation to the average child. Cheating may have its origin in physical or mental laziness or both, in a false pride which accentuates possession (selfishness) more than it does honesty, in a wrong estimate on the thing to be done and the manner of doing it. The cure of such an evil cannot be prescribed for on general principles. Symptoms must be studied, the

origin of the disease ascertained, and particular specifics applied. To do otherwise is about as rational as for a physician to prescribe calomel for all kinds of ailments. If the diagnosis disclosed the trouble to be what is often termed "physical laziness," a discriminating and humane teacher will seek to determine the cause or causes of this. She may find it rooted in some hitherto hidden physical defect whereby motor ability is impaired; or in nerve fatigue, due, it may be to *loss* of sleep, improper diet, or other equally debilitating factors; or, finally, to a false notion brought about by irrational home training whereby his burdens have been lifted without his having to put forth much physical exertion. Whatever a close study of the problem reveals the teacher will begin to have the child try to put in the bottom rung before she asks him to scale, at one leap, the entire length of the ladder of honesty. She will, it may be, endeavor to develop motor ability, correct physical defects, awaken torpid and unused muscles, suggest a course of exercises, and possibly of dietetics, resort to various devices to stimulate pride in physical feats. But she will never let her purposes become even matters of speculation with her subject. This accomplished the cure of cheating which has as its basis in physical laziness is practically assured. And since the causes that gave rise to it are removed the cure will prove far more effectual than that often attempted by administering allopathic doses of "birch tea."

Whether or not the teacher makes much headway in her quiet investigations into the causes of torpidity of the essential virtues in character building, she will at least be led to observe more closely both normal and abnormal activities, and therefore be the better prepared to apply rational remedies for the prevention or cure of those moral maladies incident to the instruction and discipline of a room full of children.

Fort Smith, Ark.

Literary Element in School Reading.

By Clarence S. Giffin.

Recently I had occasion to observe the reading which was interesting a young girl sixteen years of age, a graduate of one of our grammar schools. She was reading a so-called "Family Story Paper." The stories were nearly all continued ones of which the following were some of the titles: "Eileen, the Rose of Killarney, or the Romance of a Wild Irish girl," "The Handsomest Brunette in New York, or Her Sister's Foe," "The Thorns of Love, or the Deep Mystery of Deepdene Valley," "Evelyn the Actress, or the Leading Lady of the Corinthian." There were a number of others of the same type and the girl thought they were all "perfectly lovely." I shall assume that I did not accidentally meet the only grammar school graduate who thought such trash "perfectly lovely," but that "There are others;" and I asked myself why should such reading interest them? Let us turn our attention to our school reading as a possible cause and likewise a remedy.

At present our pupils pass from the blackboard, chart, and primer to the graded readers, and continue their use as the chief source of their reading throughout the school course. The selections in these readers contain the body of literature to which the pupil is introduced during the school course; a literature, ephemeral and devoid of literary merit and hence as capable of making a lasting impression upon the child mind as putty rifle balls upon steel. Especially is this true of the graded readers up to the fifth or sixth grade, between which and the first the majority of pupils pass their school life. They have for the most part no introduction to real literature; great attention is paid to teaching them how to read with fluency and ease and with rhetorical effect, but what to read receives little or no consideration; better far, I believe, that they knew not how, unless they knew what to read. There should be no disassociation of the art and the content. A natural economy places them side by side and they should go hand in hand. We should teach what as well as how to read. Pupils spend days and weeks pondering over books which are as much left behind when they leave school as are the jackets and shoes which they outgrow.

What child looks back and recalls the ordinary incidents, the vague and shadowy characters, with which our graded readers are mostly filled? After the primer and blackboard periods are passed good literature is as serviceable for acquiring the purely formal drill in reading as is poor, and since the good leaves an impression behind beneficial and serviceable, why not employ that and practice a true economy which will enable the pupil to acquire a force of character and a cultivated taste as well as an art.

The question arises, What is the natural introduction of the child to this field of literature? We cannot pick him up and drop him in among Scott, Longfellow, Tennyson, and others, and tell him to feast and munch until satisfied. He must be led gradually to an appreciation of such authors. We must remember that there is a genuinely classical element in select fairy tales and myths which is as much adapted to stimulating and arousing the minds of children as are Thanatopsis, Evangeline, or Macbeth of arousing the minds of adults. After leaving our primer and blackboard behind, it seems as if the only logical source we have from which to supply our children with reading material is from choice child literature as found in our fairy tales and myths and folk stories. One chief reason for their introduction as regular reading matter is the interest they arouse in the pupils' minds and the lasting impressions which they make.

If we ourselves look back to our early school days, what reading stands out most prominently? In what did we take the most interest? What made the lasting impressions? Was it in the stories and vague characters of our Second and Third Readers or in the Robinson Crusoe, Cinderella stories and books which we had outside of school? Did you receive any literary taste or an impulse leading upward from Grimm and Hans Andersen to Shakespeare and Milton from your school reading or from the out-side-of-school influences which surrounded you? There was perhaps a drawback to the use of these juvenile classics in the school-room years ago, in that suitable editions had not been published; but we cannot now claim that such is the case, and I can see no good reason for asking our pupils to pass through a stated number of First, Advanced First, Second, Advanced Second, and Third readers with an occasional deviation only from the beaten path, when classical child literature is knocking at the doors of our public schools asking for admission into our lower classes, that an inspiring and ennobling influence may be exerted for the enlightenment of the child mind and for the laying of a good foundation for the enjoyment hereafter of a steady progress in the higher atmosphere of poetry and inspiring literature.

We see now, in nearly every course of study in reading, good literature creeping in under the guise of supplementary reading, which may possibly be used in the upper grades as often as once a week. I cannot understand why our most wholesome and substantial reading should be dished up to our pupils as a delicacy to be only occasionally indulged in. Shall the child mind be starved four days in the week that it may have a feast on the fifth day? Is this the way to develop a strong, healthy mind and a vigorous intellect?

It is useless to ask which the pupils would choose to read if given a choice between the ordinary Third Reader and "Hoosier Schoolboy" or "Robinson Crusoe." Let us give the child, at the point, credit for a naturally intelligent discrimination between what is wise and vicious. "If a child ask bread will ye give him a stone?" Rather let us be wise and "give good gifts unto our children," and lay the foundation for a literary movement which will mean eternal bankruptcy for the publishers of our vicious blood and thunder trash and open up to the youthful mind a world of noble and inspiring thoughts and incentives which make life worth living.

Newark, N. J.

Science and Geography.

Experiments Introductory to Chemistry.

By F. L. Stevens.

A survey of some of the books on chemistry which are most widely used throughout the country discloses the fact that the variety of opinion as to the most desirable way of introducing a student to laboratory work is large. In some cases the divergence is evidently due to a distinctly different conception of the function of chemistry in a general, foundational education. But in most cases this assumption cannot explain the facts; for, while there is vast diversity in the introductory experiments there is a striking uniformity in the sequence of topics and of the illustratory experiments used after the introductory period is passed.

For example: nearly all authors agree in placing the study of hydrogen, oxygen, and water well to the front of the book, while nitrogen may precede some of these in some cases. Water may be studied first then analyzed into hydrogen and oxygen and these taken up in turn, or oxygen may receive attention first, then hydrogen then the result from their combination. The reasons are evident to all. The presence of water everywhere; its familiarity; its importance and the ease and conclusiveness of experiments dealing with it make it desirable for early study in the laboratory.

After considering the introductory experiments the Committee of Ten gives the sequence of oxygen, nitrogen, water, hydrogen.

Remsen in his widely approved books gives oxygen, hydrogen, and water. And in a dozen other books which might be mentioned a similar order is observed. Occasionally we find air considered to some extent evidently with the purpose of giving an easy step to the introduction of oxygen.

The non-metals almost universally receive consideration before the metals and experiments mainly qualitative in character and illustrative of properties and not to any great extent dealing with purely theoretical questions are used, thus the general unanimity of opinion as to the function of chemistry in an elementary education is evidenced.

The uniformity of treatment after the introduction and lack of it in the introduction would, then, seem to argue that more difficulty is encountered in selecting the early experiments, than in planning the body of the work. This is not surprising as we consider the importance of first impressions upon a beginning class, the necessity of a beginning which shall be logically connected with that which is to follow and which shall acquaint the pupil with a few fundamental ideas new to him, and when we realize the fact that we have, staring us in the face, the dicta, "simple to complex" and "known to unknown."

Consider for a moment the function of these introductory experiments. Remember, if you please, the first time you entered a chemical laboratory to work and the mixed sensations of wonder, awe, curiosity, interest, fear, and ignorance which seemed to overwhelm you (unless you were a private devotee to the science in still earlier days, as many of our present teachers and pupils were).

In early experiments the pupil must learn *how* to experiment, *how* to make exhaustive observations, *how* to compare facts, *how* to accurately generalize, *how* to draw strictly logical conclusions and note and distinguish cause and effect, *how* to do clean work and tell the truth without distortion, and finally to use judgment in the selection of data for the note-book.

There is much of pure manipulation, too, that must be learned and some authors advocate separate experiments as introductory to illustrate such processes as filtering, boiling, precipitating, glass working, crystallizing, evaporating, etc., and we might add lighting the gas and turning on the water.

These things must be taught early and in addition to this most authors stand on common ground in the agreement that the idea of an element, a compound, a chemical and a physical change, a chemical compound, and a mechanical mixture should be introduced early, although sequence, means, and method are varying.

Let us now consider the means of inculcating these ideas.

Should manipulation be made to have separate experiments? Why not teach how to filter when the time for that operation comes? It will take as much time to teach it at one time as at another and when the need of the act is evident the pupil will take a far greater interest in the process than when its utility is a matter of mere future speculation. The same is true of the other processes mentioned. The bending of a glass tube or the polishing of its ends may be taken up by a class when this apparatus is needed.

Manipulation aside then, the first experiment should furnish material for exhaustive observation, ample class notes, care, cleanliness, logical inference, and it should illustrate one of the six subjects mentioned. It should have a definitely outlined object and be simple in execution. Brilliant experiments should be avoided here as the brilliancy would tend to detract from all following experiments which might be less showy and would also, to a great extent, fix the pupils' attention upon the showy rather than the educational features of the experiment.

Of the facts to be illustrated, the logical starting point would be with the idea of an element which may possibly be best illustrated by the experiment suggested in Shepard's Chemistry of heating a platinum wire in a burner to incandescence. It shows to the unobserving pupil nothing, but leading questions will quickly bring forward answers and teach the tyro that his eyes must be used to better advantage if he would see all that takes place about him. Accuracy is emphasized by leading the pupil to see that the expansion is largely apparent and not real. Ingenuity developed in finding why the wire is not hot in the middle of the flame. Care and cleanliness in seeing the effect of impurities on the wire and accuracy in noting will be developed throughout the experiment. The wire may then be treated with nitric and with hydrocholoric acids, hot and cold, and familiarity with methods of heating liquids in glass be developed. A small piece may be placed on charcoal with sodium carbonat and potassium chlorat or nitrat, and heated with the blowpipe.

The pupil, now realizing that the object was to determine whether platinum can be separated into simpler substances, will be ready to say "Platinum cannot be separated into simpler substances." Here his logic may be criticised and the fact pointed out that all possible means of separation have not been tried and a strictly true conclusion can then be formulated. The definition of an element can now be introduced with a full understanding of its meaning.

A second substance may now be taken up with the same question, "Is it an element," and a different answer secured. By various authors the following substances are suggested: coal, sugar, wood, galena, murcuric oxid, lead oxid, alum, etc.

It is a question as to which of these experiments should come first. They are about equally adapted to training in observation, note taking, and manipulation, and the chief point of difference is that with the second the student experiments with familiar substances, while in the first with a simple substance.

At the conclusion of the experiment, however, two ideas are firmly fixed as a basis for further work and the pupil is becoming at ease at work and is beginning to understand what it is to answer a question by experiment.

Physical change may be illustrated by grinding marble or granite, heating the platinum wire, bending it or cutting it, or in almost infinite other ways. Chemical change may be illustrated by similarly heating magnesium ribbon, placing marble or some metal in an acid and carefully examining the products and noting the

essential difference between a physical and a chemical change.

A mechanical mixture is shown in the examination of some coarse granite and separating it into its constituents, or by mixing iron and sulphur or copper and sulphur, and having first determined enough of the properties of each to enable the pupil to recognize it, it may be proved that before heating they exist separately and uncombined hence form simply a mixture. After being heated search reveals neither of them, but an entirely new and different substance, which illustrates a chemical compound.

It would seem now advantageous to introduce a quantitative experiment to further emphasize exactness and to illustrate the law of definite proportions. This may be nicely done by preparing ammonium hydroxid from ammonia and hydrochloric acid, using a burette or a graduated test-tube.

The order of experiments here given is submitted after much thought and an extended comparison of the sequence adopted in various text-books and manuals now in wide use, and seems to be a logical and easy introduction to the subject.

Columbus, Ohio.

Outline of Physics.

By ELMER E. BEAMS.

Suggestions:—At first cultivate in the pupil a habit of close and exact observation, and power to form correct inferences from the facts observed. In order to do this the pupil's mind must be brought into direct contact with such facts.

Have the pupils make all needful experiments under the direct guidance and observation of the teacher.

Cultivate an economical spirit in the preparation of the apparatus by using the most inexpensive material.

Learn principles, no set definitions.

Have pupils to talk connectedly, logically, and correctly, describing *what* they do, telling *what* they observe, and giving their conclusions.

From time to time have pupils give formal compositions on all work done, observations made, and conclusions drawn.

Encourage pupils to make other experiments than those outlined in the "Course of Study."

Pupils should know the common application of facts developed to the practical processes of life.

Never do for the pupil *what* he can do for himself. The teacher should guide, but the pupil should do the work.

OUTLINE.

A. Matter and its Properties:

1. Impenetrability.
2. Divisibility; the molecule; the atom.
3. Porosity; the relative position of molecules.
4. Density; quantity of matter in given volumes.
5. Attraction; gravitation; cohesion; adhesion.
   - (1) Gravitation—weight, center of gravity.
   - (2) Cohesion—hardness, flexibility, elasticity, brittleness, malleability, etc.
   - (3) Adhesion.—capillarity.
6. Theory of the constitution, of matter.
7. Three states of matter—solid, liquid, and gaseous.

B. Mechanics:

1. Solids.
   - (1) Machines—levers, inclined plane, pulleys; the uses of all kinds of machines.
2. Fluids,
   - (1) Liquids,
     - (*a*) Pressure and its transmission; the pressure due to gravity.
     - (*b*) Buoyancy—floating bodies.
     - (*c*) Equilibrium.
   - (2) Gases; atmosphere.
     - (*a*) Pressure of gases—barometer, siphon, common pump.

C. Heat:

1. Sources of heat and way of producing heat.
   - (1) By mechanical force.
   - (2) By chemical force.
2. The effects of heat in matter:
   - (1) Expansion and contraction—solids, liquids, and gases; the common thermometer.
   - (2) Change of state:—(*a*) liquefaction and solidification; (*b*) vaporization and liquefaction.
3. How heat is communicated:
   - (1) Conduction—solids.
   - (2) Convection—liquids and gases.
   - (3) Radiation.

D. Sound:

- (1) Nature of sound—vibrations.
- (2) Transmission of sound—solids, liquids, and gases.

A Lunar Landscape Illuminated by the Earth.

If we stood upon that face of the moon which fronts the earth and looked back toward the latter we should see it hanging in the sky, and slowly swinging about a little, but never either rising or setting. From the center of the visible lunar hemisphere the earth would be seen directly overhead, while from the edge of that hemisphere it would appear poised upon the horizon. And in either case, while remaining always nearly at the same place in the sky, it would present in succession phases similar to those which the moon presents as seen from the earth. There would be "new earth," "earth at first quarter," "full earth," "earth at last quarter," and "old earth."

Since the mean diameter of the earth is 7,918 miles, while that of the moon is only 2,163 miles, and their disks are as the squares of their diameters, it is clear that the earth, when in the "full" phase, must appear from the moon more than thirteen times as large as the full moon appears to us. Supposing the reflective power of the earth's surface to be the same as that of the moon's surface, the amount of light which the earth sends to the moon must then be more than thirteen times as great as that which the moon sends to the earth.

Seen from the moon the earth would present a spectacle of indescribable beauty. The varying tints of its surface, from the dark expanses of the oceans, through the green of the broad forest regions, the grays and yellows of the exposed continent areas, and the glittering white of the polar snows would be heightened, and still further varied, by the effects of its atmosphere. The spectator would see the great globe slowly turning and presenting in succession all its lands and seas to his view. Vapors would here and there conceal its surface, broad belts of clouds, luminous in the sunshine, would at times partly encircle it, and with the vicissitudes of the seasons a wonderful diversity of color and tone would be presented by its landscapes. The sight of the beauties of the earth as beheld from the moon would surely stir our pride in the planet that gave us birth.

The Seasons.—Their Cause.

1. What relations of sun and earth could cause variations in length of noon shadows?

2. How much of the earth's surface has light at the same time?

3. When the sun is vertical at the equator, what part of the earth's surface receives light in 24 hours? Date?

4. On that day where does the sun rise at Chicago? What is the noon angle?

5. Same date, what is the noon angle and where sunrise at Rio Janeiro? Iceland? Hammerfest? Cape Town, Africa?

6. When does our noon angle approach nearest a right angle?

7. On that date where is sun vertical?

8. Where does the sun rise to us on that date? To Hammerfest? Quito? Terra del Fuego?

9. What is the length of our solar arc on that day? Of Hammerfest? Of Quito?

10. What part of a meridian has noon at the same time? What part of parallel?

11. Where do the people living on the same parallel see the sun rise? Where on the same meridian?

12. When a meridian bounds the lighted area, what part of all the parallels are lighted at once? What is the length of day?

13. When half of any parallel is lighted, where will the people living on that parallel see the sun rise? How long will their day be?

14. What people always see the sun rise in the east? What is the length of each of their days?

15. On December 21, how many degrees from the zenith are the vertical rays of the sun at Lake Victoria, Africa; Calcutta; Cape North, Iceland; Chicago; Victoria Land, at noon? Midnight? How many degrees from zenith?

16. What is the limit of the sun's most slanting rays, September 25? December 21? March 17? June 20?

17. What causes variations of length of day? Night? Of change of place of sunrise? Sunset?

18. What causes variation of noon angle?

19. If the earth's axis were tipped one degree from the perpendicular to the plane of its orbit, what would be the width of zones?

20. What will be our noon angle, June 21?

21. Where will the sun rise?

22. Suppose the axis were tipped 20°, what would be the width of zones?

23. What inclination of axis would allow us to see the sun at midnight in our horizon, June 21?

24. What inclination of axis would make all the zones equal?

25. What inclination would give us twelve hours light daily?

26. What inclination of axis would give Quito one day 24 hours long?

27. If the axis of the earth were perpendicular to the plane of its orbit, what seasons would we have?

28. If the earth were in the form of a cylinder, the axis perpendicular to the plane of its orbit, what seasons would the different people have?

29. If it were a rectangular prism what seasons would the people of the earth have?

30. What is the position of the earth in its orbit March, June, September, December?

31. Why do the equinoxes and solstices not occur yearly on the same date?

32. What is the difference between solar and sidereal day?

33. Could there be a better arrangement of seasons for the land surface?

34. Would it be better if the equator were differently located?

35. What is the position of the earth in its orbit March, June, September, December?

36. What causes shape of earth's orbit?

37. Effect of planets on shape of earth's orbit?

38. What about rate of earth's movement in different parts of orbit?

39. Which is longer, our winter or our summer? Why?

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—*C. C. N. S. Envelope, May, '96.*

An Object Lesson on the Lake.

By A NORMAL GRADUATE.

General purpose.—To lead the children to observe and think.
Special purpose.—To teach the formation and appearance of lakes.

MATTER.

There was a basin on a mountain side. A river flowed down the mountain into the basin and formed a lake.

Harry and Annie sailed their boat on the lake. (This to be written on the blackboard in the course of the lesson.)

Teacher.—A fleecy white cloud was floating over a tall mountain. The little drops of water in the cloud saw that the great mountain looked parched and dry, and they said to one another, "Let us fall upon the mountain and freshen the grass and flowers." Then the little cooling drops fell down, one upon another, and the grass grew greener, and the flowers brighter. But so many of them wanted to help that too many fell down for the thirsty ground to drink them all up.

More and more drops fell. Finally a little stream was formed, which danced merrily down the mountain side, jumping over the pebbles that lay in its way. Other little streams came to join it; soon it became quite large—so large that persons called it a river. As this river flowed along it came to a large hollow on the side of a mountain. The little drops were pleased with the large place they had found, and they hurried in. At last the hollow was full, and then what do you suppose was there?

Children.—A lake.

Tr.—Yes, we will call this a lake. I will make a mountain for you with this clay, and let you see for yourselves how the la is formed.

As the teacher proceeds with her modeling she talks to the children, questioning them about what she is making, thus:

Tr.—What part of the mountain is this?

Ch.—The mountain side or slope.

Tr.—And what do you call this?

Ch.—That is the basin.

Questions like these will be asked in each stage of the progress, reviving all the terms the children have learned in connection with the mountain.

Tr.—Now look carefully and tell me what I do.

Ch.—You drop some water on the mountain. It flows down the mountain side into the basin and forms a lake.

Tr.—Yes, that is exactly what I did. Suppose, now, that there was a ring of mountains. What do you think the streams running down their sides would form in the valley at the bases of the mountains?

Ch.—A lake.

Tr.—Such lakes are very beautiful. Now I shall show you a picture. Look closely and tell me what you see.

Ch.—There is a lake.

Ch.—And I see a little stream that forms the lake. And there are the mountains, where the stream runs down.

Tr.—We can't see the basin, can we? How do we know is there?

Ch.—The lake is so much broader than the river.

Tr.—You have told me just how the river is formed. I shall write it on the blackboard and some very quiet little girl may read it. (Teacher writes one sentence of the blackboard matter. Child reads.)

Tr.—I will write another sentence and see who can read it nicely. (Teacher writes and child reads.)

Tr.—It must be very pleasant to sail a boat on a lake. Have any of you ever done it?

Ch.—I have.

Tr.—Where did you sail your boat?

Ch.—On the lake in Central Park.

Tr.—On the little pond, or the large lake?

Ch.—On the large lake.

Tr.—That is a very pretty lake. It was not formed though as we found that these were.

Do any of you know how it was made?

Ch.—No, ma'am.

Tr.—I will tell you. The people thought that a lake would be very pretty in the park, so those who were fixing the park had a basin cut, and connected it, by pipes, with the reservoir, and the water as it flowed in filled up the basin and made the lake.

Some of you may go to the mountains next summer. If you do, I want you to look very closely, and see if you can see any little streams that make lakes; or if there are large lakes try to find the rivers that make them.

I am sorry that I cannot hear all you want to tell me about lakes. Some other day we may have an opportunity to talk together, but we have no more time to-day. Girls may stand, face, pass!

(The story with which the lesson opens may be used for reproduction, or as the basis of a script reading lesson.)

Child Life in Other Lands.

Japan, the Children's Paradise.

(The *Literary Digest* (New York) for October 17 prints translated portions of an article about Japanese children written by Mlle. Renee Sevin Desplaces, for the *Magazin Pittoresque* (Paris, September 15). This may be used as material for vivid description in the geography lessons about Japan.)

Visitors to Japan may have different opinions about the picturesqueness of her landscapes, the color of her sky, and the richness of her flowers, the solemnity of her temples, and the grandeur of old Fuji, but all agree that nothing in Japan is prettier or more interesting than her little children.

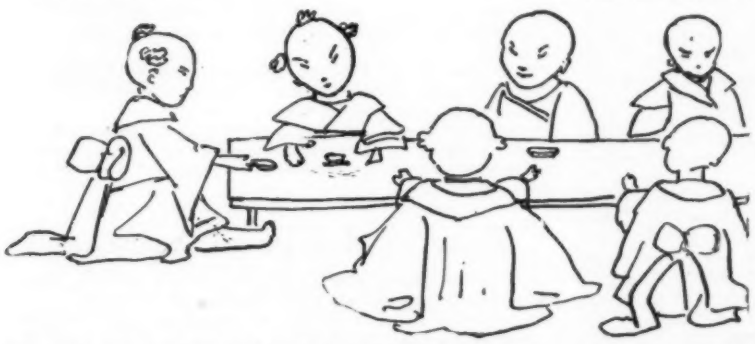
Even the young men and girls have the looks and manner of children, and many of them appear as if they were merely playing at life.

Truly Japan is a children's paradise! Nowhere are there more of them; nowhere are they better loved. The sweetest religious sentiment of Japan is filial love, and parents who love their children passionately are amply recompensed for this affection by the care and respect with which they are surrounded later in life, when they have reached old age.

It is a charming spectacle to see the children in Yokohama, when they go, at the beginning of springtime, to look for shells at low tide. They come in groups from all parts of the city, carrying with them baskets and boxes hanging from their backs.

Having disrobed, they run joyously over the beach, prattling and crying out with glee, devoting all their energies to the search, while the heads of sleeping babies are balanced funnily on the hips of older brothers or sisters.

Japanese children are never bashful or sullen. They look you straight in the face, never draw back if you call them to you, and although intimidated by the familiarity of strangers, they smile at you if you show them a friendly face. And curiously enough you can draw a crowd of them immediately if you seem interested in some invisible object. Thus a passer-by in Europe who looks into the air will soon see a crowd gather about him. In Japan this crowd is one of children.



The custom of shaving their heads is disappearing. You know in what manner this is done. Only a little lock of hair is left just at the top of the head, and sometimes also a tuft at the neck.

Many children have eczema on the shaven part of the head, a trouble attributable perhaps to unclean razors. This spoils the looks of the little creatures, but no mother in such case would resort to medical treatment. All believe that the cause is some interior trouble of which the skin-eruption is only a symptom, and none of them would for the world consent to take any care

of it. Besides the trouble stops as soon as the parents stop shaving the child's head.

Two days in the year are exclusively devoted to children. At Tokyo, Kioto, Yokohama, and in all the cities of Japan there is a day when the shops are full of toys, little models of persons or things, or even figures of the entire Japanese court in miniature. This is on the great holiday for little girls.

At this time, large and small are dressed in garments of all colors and affect the most extraordinary headdresses. The mothers are very proud of these toilets.

The corresponding boys' holiday falls on May 5. Then they are seen scattered everywhere about the country. At each house is raised a bamboo mast from which hang, blown about by the wind, strings of paper fishes. These represent carp, and are symbols of energy and constancy. For as the carp can ascend streams against the strongest currents, just so a studious child can, in following the difficult current of life, acquire fortune and renown.

There are as many of these paper fish at each house as there are children in it, so that at some houses as many as a dozen fish may be counted on the masts.

Japanese children love also the sport of kite-flying. They make kites with strips of bamboo on which is fastened the paper of very tough texture, common in Japan. Some kites are of huge size and can be raised many hundred yards. Veritable swarms of them may often be seen flying above villages. The children attach to them little devices that, under the influence of the wind, give out a most curious musical humming sound.

The Japanese child is neither rough nor brutal. He is full of life and spirits, nothing more. He spends his money for fruit and candy like other children and takes his pleasure in a more rational way than the American child, being both less strong and less combative. Wickedness seems unknown to him.

The coolie child, with his brown face and bare legs, is always interesting. How many things he can carry on his back! . . . Under his big straw hat you often see a finely formed face, but it is almost always sad, with the resigned expression common to children who suffer.

But the child that attracts most attention is the child of the *sampans* [boats]. Each *sampan* is generally navigated with the aid of two heavy sweeps, managed by two children of whom the youngest is often not more than eight or ten years old. Under the eyes of parent or patron the young boatmen give proof of incomparable address and agility. They live on board the boat, eating and sleeping there, and so are trained to be excellent sailors for the Japanese navy.

Foreign firms also employ in their offices a certain number of Japanese children as clerks or errand-boys. . . . It is said that all little Japanese, especially these messenger boys, have a special talent for whistling. They even whistle European tunes!

We should say, in closing, that in Japan people love children so much that when they have none of their own they adopt one, and if a Japanese thinks he is too poor to support his child he hastens to get it adopted by some rich family, which he always succeeds in doing.

Animal Study.

The Horse.

By FRANK OWEN PAYNE.

(For illustration, see cuts in large Chart.)

We will first consider the structure of the horse, beginning with the skin or hide.

1. *The hide.*—This is tough, thick, and covered with short hair. On the back of the neck the hair is long and coarse, forming a mane. On the inner surface of the legs are warts or calloses. In most horses the hair on the legs is somewhat shaggy. The tail is long, flowing, and consists of hair similar to that of the mane. The skin is elastic so that the horse may move it at will. This enables him to shake off flies when they alight upon him.

2. *The flesh.*—Just beneath the hide is found the flesh or muscles which are used to produce motion. The flesh is bright in color and resembles beef. In some places horse flesh is used for food, but it is not in general use, the horse being too valuable an animal to use for this purpose.

3. *The bones.*—Beneath the coat of muscles lie the bones. These are bound together firmly by stout bands of ligament to form the skeleton.

4. *Cavities.*—The bony framework incloses two cavities, (*a*) the neural or nervous, and (*b*) the digestive. The neural cavity begins with the skull, and extends downward and backward through the spinal column. The brain and spinal cord fill this cavity.

The digestive cavity is much larger and begins with the mouth, gullet, stomach, etc.

5. *The stomach.*—This is not like that of the cow. It is simple and is fitted for the digestion of vegetable foods.

6. *The teeth.*—The horse has forty teeth. These have long roots and broad, flat crowns. The upper canines come late and they are sometimes wanting in mares. The dental formula is,

$$i\frac{3-3}{3-3},\quad c\frac{1-1}{1-1},\quad pm\frac{3-3}{3-3},\quad m\frac{3-3}{3-3}=40.$$

In this formula *i* stands for incisors, *c* for canines, *pm* for premolars and *m* for molars. Figures 4, 5, 6, and 7 show various aspects of the teeth.

7. *The lips.*—These are flexible and prehensile, enabling the horse to seize food readily.

8. *Food.*—The food of horses is exclusively vegetable, grasses and herbaceous plants when the horse is wild and free, hay, oats, and corn when he is domesticated. The teeth, stomach, and intestines are especially adapted for digesting such foods.

9. *The foot.*—The foot of the horse is a wonderful structure, consisting as it does of one toe. This toe springs from a bone called the "cannon bone" which is really one of the phalanges. The end has a nail-bone protected by the hoof. On each side of the cannon bone are splint bones. These are the remains of former toes. The horse, therefore, walks upon his middle toe nail.

10. *The legs.*—The fore legs are nearly in line, and are parallel with each other. The shoulder joint makes a great angle with the arm.

The hind legs incline toward one another so as to project the body forward at a great rate of speed. Each leg has a warty spot on the inside.

11. *The eye.*—The eye is large and expressive. Pupil oblong.

12. *Family.*—The horse belongs to a group of animals called *perissodactyla* or animals having an *odd number* of toes. The rhinoceros and tapir belong to this group. The ass, quagga, and zebra are nearer relatives in the same group.

13. *Habits.*—The horse is noted for his cleanliness. He will rarely eat hay which has been tramped upon and he refuses to drink stagnant or muddy water. In this respect he is very unlike the ox and many other animals.

14. *History.*—Geology tells us that the horse is descended from a three toed ancestor now extinct, called *hipparion.* This ancient horse did not walk on three toes. He walked on the middle toe, but the other two hoofs dangled behind it in the place where the splint bones now are found, Figs. 1 and 2. Man has used the horse as a beast of burden for thousands of years. Ancient inscriptions, bas reliefs, and manuscripts prove this. In all ages the horse has been the companion of man.

15. *In general.*—The horse seems well fitted for roaming over vast plains where food is plentiful. Herds of wild horses roam over steppes of Asia, South America, Russia, and Texas. Those found wild in the western hemisphere are doubtless descended from horses of the colonists.

The ears of horses are short. Asses have longer ears, a tufted tail, and erect mane. In asses the callosities are found only on the forelegs. Asses are much smaller than horses.

II. THE LESSON OUTLINE.

1. *Preparation.*—Let there be a conversation about various domestic animals, the cat, the dog, the cow, the goat, the horse, poultry, etc. Which of these is most useful? Which most common?

Which is smallest? Which largest? Which neatest? Which do you like the best? Why? Which is largest of all domestic animals used by us? We are going to learn what we can about the *horse.* You may all think and be able to tell me something about the horse. It is often good to prepare for the lesson the day before, requesting pupils to observe horses and see who will be able to tell the most about them from actual observation. Having prepared the pupils in this way, they will be alert and ready for the next step.

2. *Presentation.*—Begin this division of the lesson by eliciting as much as can be obtained from the pupils, permitting them freely to converse about the horse, but always keeping the question well in hand and never allowing the pupils to wander away upon *other themes,* however closely related to horses.

It is here that the chart comes into play, for after the pupils have told all they know about the horse, the chart may be referred to by the teacher, and the pupils may be directed to find these things upon the chart if they have not been seen before. An adjournment to the street where the horse, living and moving can be observed, is most helpful in the presentation of this subject.

Indeed if some pupil is the fortunate owner of a horse, there is no reason why the horse should not visit the school-yard and pose for study.

3. *Association.*—Are all horses like this one? What kind of horse is this? How do race horses differ from work-horses? Is the horse in the chart a race-horse? Why not? Compare the legs, feet, body, etc., of race-horses with those of perchow or Norman horses and Shetland pony. What kind of horses are best suited for the farm?

What kind can best draw a fire engine? Having drawn all kinds of comparisons between horses, it is well to introduce a comparison between the horse and the ass.

The zebra is well known to most children through pictures and the menagerie. The knowledge of the horse should be so systematized here that the pupil will have a comprehensive idea. Constant reference to the chart will greatly aid in this. Thus from the general cut at the bottom can be studied the horse in general, the ass, and a comparison of the two may be made. Compare 1, size 2, shape 3, ears 4, tail 5, mane 6, feet 7, general intelligence of their appearance. Figs. 1, 2, and 3, show the foot and its skeleton in various positions.

Figs. 4, 5, 6, and 7 show the teeth. Fig. 8 shows the side view of the skull, and Fig. 9 the eye with its oblong pupil.

With older pupils separate parts may be compared with the same parts of other animals, *i. e.*, ears with other ears, eyes with other eyes, tails with other tails, etc., etc.

4. *System.*—By means of a few well-directed questions, call out the main facts about the horse, freed from all minute detail, the prehensile lips, remarkable teeth, peculiar eye and wonderful foot, just to bring into relief the salient points.

5. *Application.*—Of what use to the pupil is all this knowledge? The pupil must be made to see that there is much practical use in all that he has learned about the horse. For example, a study of the foot ought to show him why it does not hurt to shoe a horse if the nail is driven into the hoof properly. Why is it necessary to shoe horses which are used for heavy work in cities? How is it possible to put a bit into a horse's mouth and not injure the teeth? Of what use to man are the "age marks" on the teeth of horses? Does any one know of a good reason for using the check rein? Many other questions will suggest themselves to any teacher who gives the foregoing lessons on the horse.

If lessons of this kind on any animal succeed in arousing greater interest among children for such animals, these lessons will not have been given in vain.

With young children, only the main features of the above should be attempted. The chart and lessons are planned to suit all grades and the teacher herself must be the judge as to how much of it can be assimilated by her pupils.

How to Manage an Aquarium.

In order to manage your aquarium properly you will require a few simple tools. A little hand-net that can be bought for a few cents, or made for even less out of a bit of wire and a small piece of mosquito netting, is useful for catching the fish or shells without putting your hands into the water. A pair of wooden forceps, like a glove stretcher, will be found most convenient for nipping off bits of the decaying plants or for catching objects that may have accidentally fallen into the water. Glass tubes of various sizes are also useful. If you want to catch any small object in the water with the tube, place the tube in the water with your finger over the hole in the top. Until your finger is removed the tube will remain full of air. Place it over the bit of refuse or whatever

it is you want to catch, remove your finger and the water will rush in, carrying the object with it into the tube, which should then be closed at the upper end by placing your finger over it as before. A glass or hard rubber syringe is necessary with which to aerate the water thoroughly at least once every day, and oftener if possible. Fill the syringe, hold it high above the tank, and then squirt the water back again. A long piece of India-rubber tubing which may be used as a siphon is necessary for the purpose of changing the water in the tank when it is evident that something has gone wrong.

If a green film begins to gather on the side of the tank that is most exposed to the light, it should be cleaned away every day, and the sides of the glass polished carefully. A small piece of clean sponge tied on the end of a stick will answer the purpose. If the scum is neglected and left to accumulate, you will find it almost impossible to remove it from the glass even by hard scouring.

It is best to have only small fish in your aquarium, and for this reason trout are not desirable. Goldfish and minnows are very good, and the common little sunfish or "pumpkin-seed" is excellent.

You must keep careful watch over the fish in your aquarium, and if any one of them appears to be sick he should be removed at once, very gently, with the hand net, and placed in fresh water, where he will often recover.

Certain varieties of snails live well in fresh water, and will be found useful in clearing away the green film that is almost certain to collect on the side of the glass; but you must be careful or they will devour your plants as well; and if your tank is very small it is hardly worth while to try to keep them.

You must be careful not to overstock your aquarium, for your fish will not thrive if they are overcrowded. Remember, also, that heat and dust are fatal to your pets. The water must be kept clean and cool at all times, and all foreign matter and every particle of decaying vegetation should be removed immediately.

—From *Harper's Round Table.*

Form Study and Drawing.

Drawing.—The Circle.

By D. R. AUGSBURG.

In teaching drawing the copy must be used, so must the type form, so must the natural object. They all have their use and can no more be ignored than we can ignore the text-book in geology because we have the museum, or the museum because the earth is before us. The copy gives us the method, the technique. The type form, by eliminating all details brings us face to face with the principle. The natural object contains the principle, but it is obscured by the many details. It unfolds to us ideas of form and arrangement, of life, growth, and beauty in a higher and broader sense than the copy. The object contains *all* and from it we gain the power *to do.*

THE CIRCLE.

The circle is the easiest figure to see as a unit. It may be apprehended at a glance and is an excellent figure to use in acquiring the power to see things as a whole. It is said that a child

naturally sees an object as a unit. If this is so the unity almost entirely disappears the moment he undertakes to reproduce it. Ask a child to draw a tree and he will begin with the leaves twigs, branches, and small parts generally; he will proceed from the part to the whole, never from the whole to the part. The power of seeing an object as a whole must be acquired, must be taught. One of the easiest ways of doing this is to lead the child to see the circle in drawings made on the blackboard, letting the pupils copy these drawings in order to become familiar with them, and then showing them the object and letting them trace the circle there. For example: draw Fig. 2 on the blackboard. Ask a pupil to take the pointer and trace the different circles that can be seen in the nest and bird. The nest, the opening of the nest, the body and head of the bird are all circular. Let them copy this drawing on their tablets. If possible show them a real nest holding it so that it will appear circular to them.

Draw Fig. 3 on the blackboard. Ask a pupil to come to the board and trace a circle in the drawing. Let the pupils draw the tree using the circle as the basis of the top. Ask the pupils to observe the tops of trees and see if they cannot find one that is round.

Procure some round flowers and leaves similar to Figs. 4, 5, 6. Hold them before the pupils and ask them to point out what they see that is circular. Draw them on the blackboard using the circle as a basis. Let the pupils copy them.

Procure some round object or objects in which the circle is more or less obscured. Hold them before the class and lead the pupils to recognize the circle in them. Draw them on the blackboard and let the pupils draw them on their tablets.

Draw objects similar to Figs 13–18 on the blackboard. Ask pupils to trace the circle in each. Let the pupils copy them, then lead them to see the circle in similar objects.

Pupils are quick to see, and to make the application. If the blackboard part of the work is effective the pupils will make the applications without aid from the teacher.

Reports of Lessons.

Beginning Mensuration. II.

Lesson given by MR. CHARLES E. ROSENTHAL, fourth assistant in Grammar School No. 20, New York City. Reported by himself.

What will it cost to paint the walls and ceiling of a room 14 *ft. long,* 12 *ft. wide,* 9 *ft. high, at* $.07 *a sq. yd.?*

I took a paper box 14 ins. long, 8 ins. wide, and 6 ins. deep.

Fig. 4, drawn to a scale of one-quarter inch to one inch, represents the box.

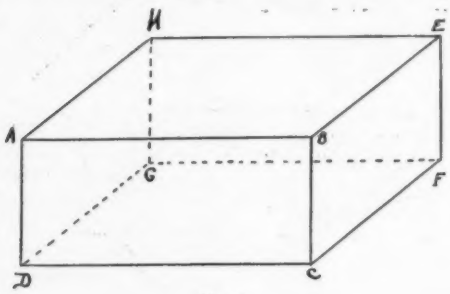


Fig. 4.

I tore off the face ABCD

How long is this face? It is fourteen inches long.

How high (in this case the height is the width) is it? It is six inches high.

Then I tore off the face behind ABCD; the pupils saw that it had the same dimensions as ABCD.

The next face BEFC was torn off.

How long is this face? Eight inches.

How high? It is six inches high.

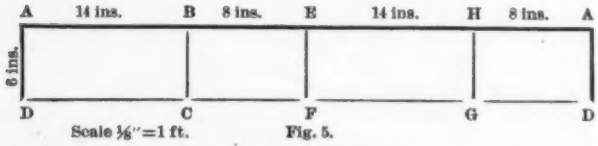
Then tore off the face opposite; they saw that it had the same dimensions as BEFC.

I took the four faces and arranged them, end to end, on the ledge of the black board and questioned as follows:

What kind of a figure do you see before you, Henderson? "I see a rectangle." (See Fig. 5. The boys must know before this work is attempted what a rectangle is.) How long is this rectangle? "It is (counting) forty-four inches long." How high? "Six inches." What is the area of this rectangle? "Its area is 264 square inches."

We next proceeded to consider the top of the box.

How long (holding it up) is this top, Kamin? "It is fourteen inches long." How wide? "It is eight inches wide." What is the area of its surface? "Its area is 112 sq. ins.



Scale ⅛″=1 ft. Fig. 5.

Then the total area of the faces and the top of the box is what? "376 sq. ins." At one cent a square inch to paint this box, what would it cost? $3.76."

(Advert to problem heading this article.)

Boys, every room may be considered as a box. Let the figures in the above problem represent the dimensions of this class-room. Let the wall in front of you (draw picture of box on the board, scale one-eighth to a foot) be represented by the face ABCD; (see Fig. 4); wall behind you by the face HEFG; wall to the right of you by face BEFG, and wall to the left by face AHGD. The ceiling will be represented by the cover or top ABEH. (These facts should be elicited from the pupils.)

By what kind of a figure will you represent the wall in front of you? "By a rectangle, taking one inch to a foot. Go to the board and do so."

How many inches long will it be? "Fourteen inches." How high? "Nine inches high."

How will you represent the wall to the right of you? "By a rectangle." How long and how high will this rectangle be? "Twelve inches long and nine inches high."

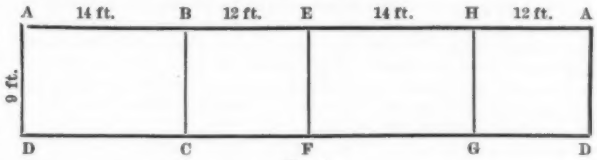


Fig. 6.

How about the wall behind you? "It can be represented by a rectangle 14×9 inches."

And the wall to the left of you? "By a rectangle 12×9 ins."

Now draw one long rectangle showing the four walls, joining one with the other. (See Fig. 6.)

How long is this rectangle, Hurwitz? "It is fifty-two feet long." How high? "Nine feet." What is its area? "468 sq. ft. The ceiling of this room may be considered as what of the box, Robinson? "The top." How long is the ceiling? "Fourteen feet." How wide? "Twelve feet."

By what kind of a figure will you represent the ceiling? "By a rectangle." Can you join it to the other rectangles? "I cannot join it." Why not? (Answers various; but some boys readily see that the height of this rectangle [twelve inches] exceeds the height of the others.)

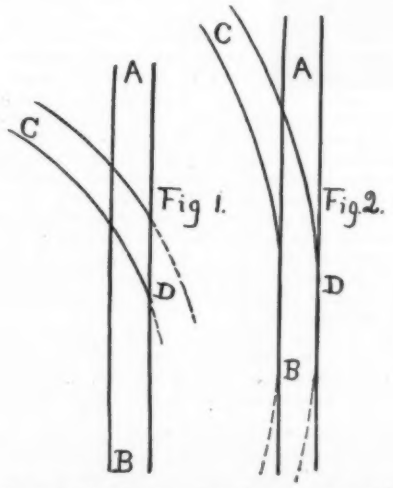
What is the area of this rectangle? "168 sq. ft." What is the total area of walls and ceiling? "The total area is 636 sq. ft."

What is the area in square yards? "70⅔ sq. yds." At $.07 a square yard what will be the cost to paint the walls and ceiling? "$4.94⅔."

Plastering problems may be treated in the same manner. I shall show how to calculate allowances for doors and windows in connection with papering problems. There is a diversity of opinions among authorities and contractors regarding the exact deductions to be made. In many instances the deductions depend upon the contract made between the contracting parties; but in the event of no such contract existing, some contractors regard twenty square feet as a fair average for one opening. Others again calculate precisely the amount of space covered by each opening; *e. g.*, if a window is 6 x 4 feet, the area of the space occupied is twenty-four square feet, and this area is to be deducted from the total area.

Tangential Lines.

Tangential lines are often a source of difficulty to boys, so I suggested to the lads that if AB and CD were railway lines, a train proceeding along CD would be unable to get on AB (Fig. 1) without a turn-table, but if the lines were arranged as in Fig. 2 (like all railway and tram lines) there would be no such difficulty.



The lads appreciated the suggestion and we no longer have trouble with tangents.

Show the lines singly as well as double.

Language.

Composition Writing.

By MINNA C. DENTON.

Oh, I've got to have compositions written to-day! If I don't hurry, it'll be time for next month's before I get these in. How I do hate it!"

It is perhaps small wonder that under these circumstances the bugbear of composition-writing does not yield any very great results. What sort of penmanship should we expect from our pupils if their efforts in that direction were confined to a single day in the month? Is writing as a mental act really so much less important than writing as a mechanical accomplishment?

But, you say, there are the daily language lessons; surely they afford ample opportunities for practice. Very well; but the daily work should not differ in kind from that expected in the composition books.

The fact is we are too much given to teaching *about* language, its rules and constructions, forgetting that the only way the child will ever learn to use correct language is by using it. We show him how to enclose a direct quotation within quotation marks, and we dictate multitudes of sentences for the sake of practice in the most complicated combinations thereof; but when he comes to compose a sentence containing a direct quotation for himself, it never occurs to him to apply the theory which he has been at such pains to learn. We labor with him over the spelling of *here* and *hear*, using every means within our power to connect the two words with a bond that shall hold as long as memory lasts; and it does hold—so well that when he wants to use one word, the other, by the laws of the association of ideas, immediately suggests itself to him. We tell him that an apostrophe denotes possession, or words to that effect; but when he writes about Tom's ball, it does not once occur to him that he has thereby implied possession, otherwise he would be quite willing to use the apostrophe. We begin at the wrong end; our logic is deductive instead of inductive; we go from the general rule to the particular instance, whereas the more natural step for the child would be, from his immediate need to the universal law. If we were to give him his apostrophe and quotation marks at the moment when he has need of them (first showing him his need, because he is not yet aware of it), perhaps the remembering of them would not be such a difficult task.

The first necessary condition, then, to the child's acquirement of the use of written language is, that he write. Not once or twice in a month or even in a week, but daily—as often, generally speaking, as the language period comes round. "What to Write About" is not so much of a problem when it comes every day as it is on the occasion of the monthly effort. Besides all the miscellaneous exercises, such as reproduction, picture stories, and the like, many teachers have the children keep blank books for daily use in connection with some study. In one school they write therein reports of their science lessons, otherwise known as "Oral work." In another school they keep calendars, in which they note the weather, the signs of the seasons, such as the disappearance of the birds, the discovery of the first wild flowers, the opening of the leaf, buds, etc. Still another room labels its pile of books, "What We Are Learning," and strives to record each day some useful information gained; while in a fourth, the children keep diaries which tell of whatever little incident the day or the hour may suggest.

While they are writing is the teacher's opportunity. *After* they have written, thinks some teacher whose desk is full of uncorrected papers. But it is not how much they write and have corrected, but how much they write and correct themselves, that is to prove the salvation of our pupils from the error(s) of their ways. So the teacher passes among them, laying her finger on a mis-spelled word, asking the reason for a faulty capital, answering the dozen and one questions which children are likely to produce on such occasions.

One of the first great difficulties as to the form of the composition that confronts the teacher of beginners is, to get him to divide his "story" into separate sentences. This is not because he has any deep-rooted objection to the use of capitals and periods,—he usually tries to sprinkle them in somewhere, knowing that it is expected of him,—but because he does not recognize the limitations of a sentence. He has not learned to analyze the continuous stream of thought that is striving to get itself on paper. So the teacher must help him. When he has finished putting down what the cat did, she tells him he must place a period and begin what he has to say about the birds with a capital. Always when it is possible she calls upon him to read his story; thus he is forced to define orally the limits of his thought. This may be made a great help to him in mastering the intricacies of punctuation.

Every new thing he tells makes a new sentence. This is the next step. When the necessity comes, she explains that after *and* he need not use a capital, because *and* can fasten the two thoughts together in one sentence. So with the other rules of sentence-building, as he has need of them—line upon line, precept upon precept—illustration, explanation, never-tiring watchfulness—such is to be the price of the child's real advancement in the art of composition.

All this *must* be said to the child by the lips of the teacher. No system of symbols of correction, according to which his paper is adorned with red ink markings, will do any part of the work. He will copy his story, putting in your corrections if he doesn't forget about them, with a dim idea that teachers must always mark papers so, and that the reasons are probably too hard for him to understand; and next time he will make precisely those same mistakes over again.

The teacher who has daily work in composition of course has no time for the marking of each individual mistake. Usually she looks over the papers just long enough to get a list of the most common errors, the words most frequently misspelled, and the general faults of the subject-matter and diction. These are brought before the class at the earliest convenient opportunity (not all at once, however); and next time before they begin to write they are reminded not to make the same mistakes.

Once in a while the papers are marked and handed back to their owners, with crosses wherever errors occur; they are then required to "correct, giving reasons." When the composition goes into the book that the child takes home for mother and father to see, this is the method most frequently adopted, since he likes to be sure that everything is all right then. Upon these occasions, it is required in some schools that the teacher mark mistakes in red ink, or grade as to "Subject-matter," "Form," "Penmanship," "Orthography," etc., so many per cent. out of a possible one hundred, in order that the parent may be able the better to judge of his child's progress toward the required standard. For myself, however, I prefer to write my comments in plain English, which may, after all, be made to mean more than per cents. "A great improvement in spelling," "Very good story, but try harder with the writing the next time," "This is almost entirely free from mistakes," at least has the merit of conveying some definite idea. As for the red ink display of errors, it can do the child no particular good, and is an insult to the intelligence of the parent.

I shall never forget the delight of the children one day when I handed them back their stories (which happened to consist of letters to their teacher) with letters *from* their teacher, explaining at some length the merits and faults of each, and containing as much encouragement for the future as might be. The following is something like one of them:

Dear Gertie:

I was glad to hear of your good luck with the puppies. No, I am afraid I can't suggest any names for them. I am afraid they might turn out as badly as two cats I once named Benjamin Harrison and Levi Morton. Harrison ran off, and Morton got into such a bad habit of stealing the cream, that we had to send him away.

I liked your letter very much, because it told about so many interesting things. You divided your sentences nicely, but I see you forgot to begin Tom's name with a capital letter. Poor Tom! I hope he won't feel insulted.

I think I wouldn't use quite so many *and's*, if I were Gertie. And I wouldn't say, "I taken him home." Can you think what would be better?

I shall be glad to get another letter from you very soon,

Sincerely yours,

Trouble? Yes, a little. But it pays. Try it and see.

The School Journal.

NEW YORK & CHICAGO.

WEEK ENDING OCTOBER 24, 1896.

If the devotees of child study think their work will result in a change of educational aims they are very much mistaken; and all investigations having such a purpose in view cannot but prove unprofitable. The aims can be derived only from a study of the ideals of society, and these in turn cannot be fully understood without a knowledge of the history of their evolution. Child study has a grand field of its own, and that is the investigations of the possibilities and methods of solving the educational problems involved in the ideals of civilization. History of education, philosophy, and child study must go hand in hand. Only a specialist can afford to devote himself exclusively to any one of these great subjects, the practicing educator of children must draw help and inspiration from all three sources.

Be sure of the aim you are expected to reach in teaching; make clear to yourself what problems are included in its scope; find the safest ways and means to its fullest realization and apply them rightly, and, finally, bring to your work the best there is in your personality. These are the great demands of modern education in which all the lesser ones are included.

It is possible "Bird Day" will be added to "Longfellow Day" and "Shakespeare Day." This may be necessary to prevent the girls when grown up from exterminating the pretty birds. At a lecture before a teachers' institute which dealt mainly with kindness to animals the conductor said he counted a hundred birds on the hats in the audience. The suggestion of such a day was made by Supt. Babcock, of Oil City, three years since.

It is important that the teacher should know why he educates. It is not enough to say that every boy ought to know how to read, write, and cipher. Education is a design of the Creator; it is as much a part of the world as electricity or gravitation; it is not a human invention. The teacher is an agent in the hands of the Almighty to cause light and knowledge and happiness to abound. To teach to read and write and cipher is a small part of his work.

A teacher applied to an agency for a position. Soon after one of his friends told him he had been asked certain questions confidentially by the agency. Among questions asked by agencies are these:

Can you strongly recommend —— as a good teacher?
Has he a high character?
Do you consider him a progressive man?
Is his reputation unblemished?
Is he considered a man that understands education?
Is he active in his community?
Is he a man of culture and does he move in society?
Does he attend teachers meetings?
Is he popular among the teachers and pupils?
Is he particular as to his personal appearance?
Do you consider him worthy of a higher position?

The October number of the *Kindergarten Magazine* contains an article of practical interest to teachers by Miss Lucy Fitch Perkins on "Oral Pictures and Illustrative Drawing." In speaking of children's illustrative drawing, Miss Perkins emphasizes the necessity of criticism on the part of the teacher:

"The danger of spoiling the spontaneity is not greater than that of false and low standards, and we must avoid the mistake of accepting mere crudity as freedom."

This is fully in harmony with the principle insisted upon by Dr. Harris, in THE SCHOOL JOURNAL last week.

Fall and Winter Meetings.

Oct. 24.—Annual Fall Reunion of the Associate Alumnæ of the Normal College at the College Chapel.
October 29-31.—Rhode Island State Teachers' Association at Providence.
Oct. 30.—Middlesex County Teachers' Association at Boston.
Oct. 30—Essex county Teachers' Association at Lynn, Mass.
Oct. 30-31.—Northern Illinois Teachers' Association at Freeport.
Oct. 30-31.—New Hampshire State Teachers' Association at the Opera House, Dover. Mr. Chas. L. Wallace, Lisbon, president; Miss Clara E. Upton, Nashua, secretary.
November 6.—New England Association of School Superintendents.
Nov. 6-7.—Southern Minnesota Teachers' association at the normal school Mankato.
Nov. 7.—New England Conference of Educational Workers at Boston.
November 12-14.—Vermont State Teachers' Association at St. Albans.
Nov. 27-28.—Eastern Ohio State Teachers' Association at New Philadelphia, Ohio.
Nov. 27-28.—Massachusetts State Teachers' Association at the English high school, Boston.
December.—Holiday Conference of the Associated Academic Principals of New York State at Syracuse.
December.—Fourth Annual meeting of the Association of Grammar School Principals of New York State at Syracuse.
December.—New Jersey State Teachers' Association at Trenton. S. E. Manness, Camden, president; J. H. Hulsarth, Dover, secretary.
December 28-31.—California State Teachers' Association at San Jose.
December 29.—Iowa State Teachers' Association at Des Moines.
December 29-31.—Colorado State Teachers' Association at Denver. P. K. Pattison, Colorado Springs, president; Fred. Dick, Denver, secretary.
Dec. 29-31.—Missouri State Teachers' association, Sedalia. W. H. Martin, pres't; J. A. Whiteford, Sec'y.
December 29-31.—Minnesota State Teachers' association at St. Paul; S. S. Parr, St. Cloud, Pres.
February 18, 19, 20.—Meeting of the Department of Superintendence of N. E. A. at Indianapolis, Ind. Supt. C. B. Gilbert, St. Paul, Minn., president.
July 6-9, 1897.—National Educational Association meets at Milwaukee, Wis.

Germany has just celebrated the seventy-fifth birthday of its greatest scientist, Rudolf Virchow. His greatest discovery was that the animal or vegetable cell has the power of multiplying

itself within the individual. Virchow claimed, and the principle is the foundation of modern medicine, that the localization of disease was a necessity, and he fixed its seat in the smallest composing element, the cell. As a politician, also, he has been very prominent. He has opposed the spirit of militarism and centralization; the battle was so warm in 1865 that Bismarck challenged him to a duel.

(The accompanying cut is made from a late photograph of Dr. Virchow, and is the most life-like we have ever seen of him.—ED.)

Association Meetings.

Council of Superintendents.

UTICA, N. Y.

The fourteenth annual meeting began October 14. There are thirty-eight cities and thirty villages in New York that have superintendents. New York and Brooklyn have several. Ex-Supt. Scott, of Binghamton, presided. The teachers' tenure of office was first discussed; then followed a paper on professional growth of teachers in service. The distribution of credits on the New York state examinations was discussed. In the evening a lecture on the Yellowstone Park was given by Prof. Bickmore.

On Thursday vertical writing was discussed, Supt. Whitney leading, and Supt. Gorton following. Supt. Cole presented a report on legislation. Supt. Maxwell presented a report on courses of study for training schools or teachers' classes. The examination of teachers of special classes was discussed; also the necessity of state schools for truants.

In the afternoon, these subjects came up: Child Study; Making Superintendence Effective; Payment of the Teachers' Quota; the Kindergarten; Reading.

On Friday these subjects came up: Should Physical Training be Compulsory? Graduation from Public Schools; Village Superintendents; The Greatest Needs of our School System; The Greatest Dangers Educators have to Meet.

The ready speakers of the council seem to be Supts. Maxwell, Cole, Blodgett, Ryan, Whitney, J. I. Gorton, Williams, Emerson, W. J. Milne, Stowell, and G. Griffith.

Professional Advancement.—Supt. E. W. Griffith said the teachers must take up psychology, also civics, also history of education; there should be a professional library; summer schools are essential; much private professional reading is essential.

Supt. Jasper said New York city had sixty-four teachers on pension (half pay) list; a new building was about to be erected, land and all costing $500,000. He proposed that principals and superintendents should be examined as well as teachers. Supt. Cole thought the school commissioners should be included. Mr. A. M Kellogg asked why not include the state superintendent?

It appeared that in Albany, Cohoes, Newburg, New York, Niagara Falls, Geneva, Schenectady, Syracuse, and Utica the teachers had a life tenure.

Distribution of Credits.—Supt. Blodgett discussed the credits the teacher would receive in the State Uniform Examination questions; in geography it would state, for example, that ten credits; in grammar, eight credits, etc., would be given; it ought to be a rule that easy questions should have few credits and difficult ones more. Supt. Sawyer differed.

Vertical Writing.—Supt. Whitney exhibited specimens and claimed it was the most legible and rapid; also more conducive to health. A fusillade of questions was poured on the speaker; it was plain the slant system had many friends yet.

Legislation.—The committee recommended the passage of a law to furnish free text-books and supplies; also that the state superintendent appoint a committee to organize a society for child study.

Schools for Truants.—In the discussion Supt. Williams led, saying several such schools were needed. Supt. Maxwell thought the compulsory law should be amended providing for schools.

Child Study.—Supt. Griffith gave an account of what had been done in Utica; 6,000 children were examined as to sight and hearing, also for color-blindness; 667 were near-sighted; 152 defective in hearing; total defective, 1,900.

Effective Superintendence.—Supt. Jasper said he had been a school superintendent seventeen years; superintendents should hold their offices for life; they should have good salaries. Supt. Emerson doubted as to the tenure of either teachers or superintendents being for life; they should stay in on their merits. What if a predecessor of mine had been in for life! Supt. Young called on the members to enter into the discussion. Supt. Kennedy felt it was most important that superintendents should be prepared for their work.

The Teachers' Quota.—At present New York gives every teacher $100 from the general fund. Shall this be given when the teacher is not licensed by state authority? Supt. Emerson and others discussed the matter and it seemed to be the sentiment that all receiving state money should have a state license.

The Kindergarten.—Supt Griffith said this was one of the most beneficial parts of the system; the kindergartners were required to have a two years' professional course after a full high school course; merely lovable girls would not answer. Dr. Baker said that in most homes the child takes care of itself for four years; this is the field for the kindergarten. Of the good trained in the kindergarten in San Francisco none had been arrested. Supt. Sawyer said in the Lansingburg schools the effect of kindergarten training was plainly perceptible.

Reading.—Supt. Chas. S. Davis, of Amsterdam discussed the "Thought Method." By this method the child can read a dozen books the first year. They begin with sentences.

WHOM NOT TO PAY.

On Friday morning, the committee, Messrs. Downing, Emerson, and Whitney, reported a resolution that the teachers' quota, $100, should not be paid to those not licensed under state authority, but teachers now employed should not be affected. Supt. Hunt, of Corning, opposed this; so did Supts. Maxwell and Emerson.

State Superintendent Skinner referred to Long Island City gutter politics and the control they had exercised over the schools; the state should not pay a dollar there. Let God be thanked there was but one such place. He desired unity and harmony. Supt. Burgess favored it. The matter was referred to a committee to report on next year.

PROMOTING GOOD READING.

Supt. Williams gave his experience at Glens Falls: No pupil is promoted who has not done the reading laid out for his grade. Supts. Blodgett, Lawton, Maxwell, and Griffith also spoke.

NEW OFFICERS.

Supt. Scott, on motion of Supt. Griffith, was made a life member, and on motion of Supt. Maxwell a resolution of appreciation of his services was put on record. The treasurer reported $128.75 on hand.

Supt. Blodgett, of Syracuse, was elected president, Supt. Emerson vice-president, Supt. Belknap secretary and treasurer. Canandaigua was selected as the place of the next meeting.

CLOSING NOTES.

At the opening Supt. Jasper, of New York city, made some remarks, it being his first visit; he was listened to with close attention.

Besides the superintendent there were several gentlemen present connected with the State Department; Supt. Skinner, Messrs. Finnegan, Downing, and Wright, and from the normal schools Presidents Stowell and Milne. All the cities were represented except Oswego; thirty of the thirty-six villages were represented.

There is no question but that a meeting like this tends to unify the thinking as well as the action of the superintendents. A defect was seen in the debates. A subject would be announced and when opened a fusillade of questions relevent and irrelevent would be poured on the speaker. There was plainly too much attempted to be done; one half the subjects, with double the discussion would have been better. The superintendents have not yet learned just what are their pressing needs. But there were evidences of a development of power to look at things together.

National Congress of Mothers.

In February, 1897, a National Congress of Mothers will be held in Washington. The congress will discuss all subjects relating to the home, especially those bearing upon the better and broader moral and physical as well as mental training of the young, such as the value of kindergarten work and the extension of its principles to more advanced studies, a love of humanity and of country, the physical and mental evils resulting from some of the present methods of our schools, and the advantages to follow from a closer relation between the influence of the home and that of institutions of learning.

Especial attention will be paid to the means of developing in children characteristics which will elevate and ennoble them, and thus assist in overcoming the conditions which now prompt crime and make necessary the maintenance of jails, workhouses, and reformatories.

Special railroad rates will be given, and suitable boarding places will be secured in advance by the local commitree. The headquarters of the congress are at 1400 New Hampshire avenue, Washington.

Lewiston (Me.) Normal Training School.

The Lewiston Normal training school is one of the oldest training schools in the country, and has for many years trained the Lewiston high school graduates for service in the city schools. This has not been all, for many of these graduates are now doing successful work in different sections of the country, and several non-residents have also received their training for their profession in this school The building (see illustration) is modern, well equipped, and well adapted to the needs of such work.

ADELAIDE V. FINCH,
Principal Training School,
Lewiston, Me.

Miss Adelaide V. Finch, the present principal, came from Minneapolis, fresh from the inspiration of Miss Arnold, and with the progressive spirit which is characteristic of that Western city. The influence of this spirit has been felt, not only in the training school, but in the various summer schools and educational gatherings throughout the state, at which Miss Finch has been a frequent instructor. It is with pleasure that we find Miss Finch a devotee of Herbartian pedagogics, and much of her professional success she attributes to this fact. At the last meeting of the American Institute of Instruction, Miss Finch was elected one of the vice-presidents of that honored association.

Miss Finch is characterized by marked administrative and executive ability; her strong personality impresses itself upon the pupil teachers and is reflected in the entire management of her school. She is a woman of literary taste and broad culture; her original poems frequently form excellent substitutes for the "gem selections" used in the class-room.

The two years' course of the training school which was inaugurated last year doubled the efficiency of the school and has made the work of the pupil-teachers more professional as well as more practical.

The following, taken from this year's circular, gives an outline of the work as carried on to-day:

JUNIOR YEAR.

I. PRINCIPLES OF EDUCATION. "FIVE FORMAL STEPS."
II. METHODOLOGY.

1. Reading.
2. Spelling.
3. General Lessons. } Nature Study, History and Literature in the Primary Grades.
4. Language.
5 Arithmetic.
6. Geography.
7. Music.
8. Drawing.

III. SCHOOL MANAGEMENT.

1. *Organization.*
   1. Passing to and from room.
   2. Grouping, Classifying.
   3. Calling and dismissing classes.
   4. Methods of passing material for work.
   5. Programs.
   6. Seat or Busy Work.
2. *The Recitation.*
   1. Objects.
   2. Methods.
   3. Questioning.
   4. *Discipline.*
   5. *School Records.*
6 *The Teacher.*— { Requisites. Points of Criticism.

IV. PRACTICAL TEACHING.

SENIOR YEAR.

I. PSYCHOLOGY. CHILD STUDY.
Text Book: Baldwin's Psychology Applied to the Art of Teaching.
Supplementary Psychologies.

II. HISTORY OF EDUCATION.

Text-Book: Campayre's History of Pedagogy.
Supplementary Histories.

III. PRACTICE TEACHING.

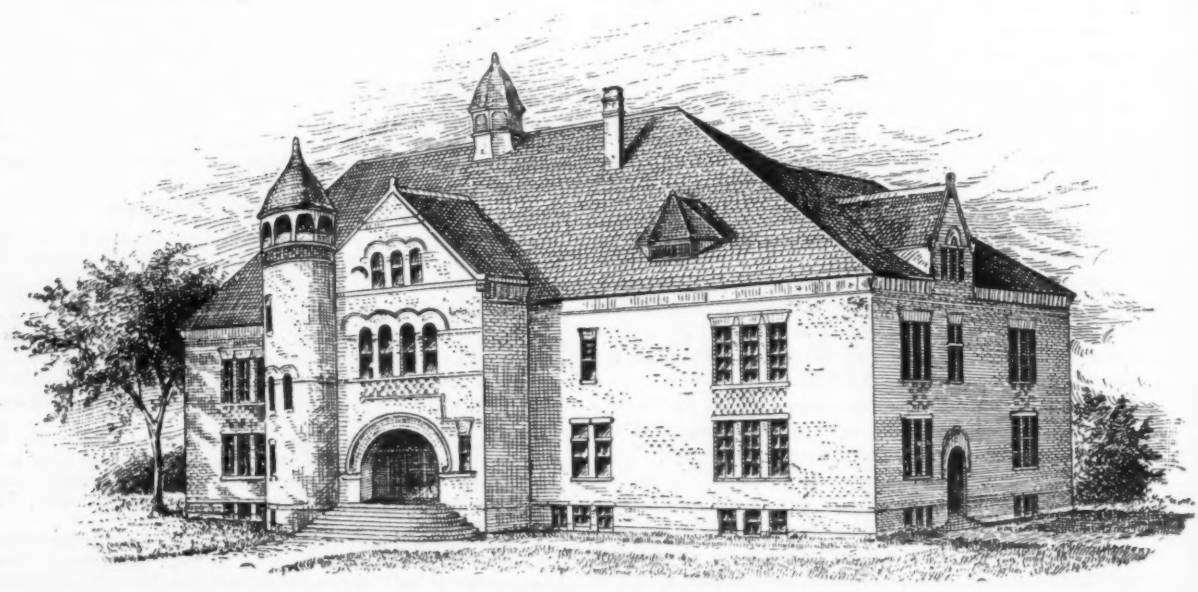
The Cambridge Conference.

Dr. Lewis G. Janes, president of the Brooklyn Ethical Association, has accepted the position of resident director of what is known as the Cambridge Conference, or the Brattle Street Conference.

The object of the conference is the comparative study of philosophy, ethics, and religion. Among the resident members already enrolled are Dr. Charles Carroll Everett, dean of the Cambridge Divinity school; Professors James, Royce, Toy, and Lanman, of Harvard; Miss Irwin, president of Radcliffe college; and Professor Dolbear, of Tufts college. Among the associate members are Professor Le Conte, of the University of California; Professor Hyslop, of Columbia university, and Professor Seth, of Cornell.

Mrs. Ole Bull is one of the chief promoters of this work, and its headquarters will be at her home, No. 163 Brattle street. The plan has met with great favor in Cambridge, where the need of this work is recognized. It is expected that many of the students in the various departments of Harvard university will become actively connected with the conference, in which they will have opportunities to meet the members of the faculty on terms of more intimacy and freedom than are possible in the class-room. Already the conference is regarded as a sort of university home.

The regular work of the conference will include a meeting each Monday evening, and later in the week a question evening. Dr. Janes is planning a course of Sunday afternoon lectures; some of these will be a repetition of the lectures given before the Brooklyn Ethical Culture Association.



NORMAL TRAINING SCHOOL, LEWISTON, ME.

New York City Notes.

At the meeting of the board of education, Oct. 21, Dr. Jenny B. Merrill was appointed supervisor of kindergarten instruction at a salary of $2,000 a year. This was the happy ending of a lively debate on the question. The strongest argument to be brought forward by those in favor of Mrs. Williams was presented by Com. Beneville, who said that because she is a married woman and a mother she would be likely to have more sympathy with children than Miss Merrill. Mrs. Mary E. Williams was appointed supervisor of cooking at a salary of $2,000 a year.

The motion of Commissioner Beneville that the city superintendent be empowered to move pupils from one school to another, was laid over till the next meeting.

A communication from the Rev. John P. Peters, rector of St. Michael's church, Amsterdam avenue and Ninety-ninth street, tendering the free use of the buildings belonging to the church for the use of school-rooms, was accepted. The buildings will accommodate 225 pupils.

A report from the committee of instruction, dismissing the appeal of William H. Nammack from the action of the board of school trustees of the twenty-second ward, in removing him from his position, was adopted.

A resolution empowering the president to appoint a special committee to report upon sites for two new high school buildings was passed. These schools are intended to relieve the Normal college and the College of the City of New York.

A resolution asking that the board of estimates and apportionment be asked to give attention to the need of the board of education for more adequate quarters, was also passed.

The board of estimate and apportionment has granted to the board of education an appropriation of $3,953,017.46, which is an increase of $53,214 over that of last year. The colleges were allowed the same as last year.

The annual fall reunion of the associate alumnæ of the Normal college will be held in the college chapel October 24, at 2 o'clock. Mayor Strong and Mr. Robert Maclay, president of the board of trustees, are expected to make addresses.

A series of lectures on psychology are being given by Dr. MacMahon at the Boland Trade school, Fifty-first street and Madison avenue, on Wednesdays at four o'clock. At the last meeting there was an attendance of 500.

The members of associate alumnæ and their friends are invited to attend the interesting meetings planned by the committee on Child Study for the winter season. The full program will be announced in THE SCHOOL JOURNAL next week. Meetings will be held in the library of the Normal college (entrance on 68th St., near Park avenue), on the first Thursdays of the months from November to May, at 4 P M. On November 5 Dr. Jenny B. Merrill, chairman, and Dr. Emily I. Conant, vice-chairman of the committee, will present reports on "Allowing Children to Choose' Mothers and teachers are requested to send instances of choice, in writing, before November 1. State circumstances leading to the choice. Answer following questions, if possible. Did the child desire to choose? Did he choose promptly? Was his choice independent? Have repeated acts of choice made him readier to choose? Has the act of choosing had any effect upon the habit of obedience? Were you allowed any freedom of choice when a child? In what particulars? Results as you see them now?

A number of New York city news items, including a report of the last meeting of the Schoolmasters' Club, must go over to next week.

Prussian and New England Schools Compared.

At the meeting of the School Masters' Association of New York and Vicinity, Prof. E. J. Goodwin, principal of the Newton, Mass., high school, spoke on "The School Systems of Prussia and New England."

Prof. Goodwin went to Germany for mental and physical recreation, but he soon became so deeply interested in the Prussian school system that he made it the subject of close study during his stay. His studies were not confined to Berlin, however, for its schools represent the best type of the Prussian system.

Prof. Goodwin said that he studied the schools of Prussia from the point of view of a man attempting to manage a large secondary school, and he compared them, not with the schools of New York but with those of New England. He was at first impressed with the exceeding simplicity of the interior of the Prussian "gymnasium," or grammar school. The teacher sat on a high narrow platform, and the pupils occupied rough wooden benches behind long, plain board desks.

Another contrast was the absorbing interest of the pupils in their work. There was no idleness and each boy seemed absorbed in his lesson. The rapt attention of the Prussian boy was explained when he learned what incentives he has for such study.

"If the boy goes successfully through the gymnasium he is exempt from two years' military service, and besides has secured the only opportunity a German boy can have for attaining to any position of rank and importance under the imperial system. Education is the royal road to success. An American boy has no such incentives. If he fails in school he can be tutored and coached through colleges and universities, and even if he fail in all he can still enter the learned professions, run for Congress, or be elected governor of a sovereign and enlightened state."

Another contrast noticed between the Prussian and American boys was in their manner toward their teachers. When a teacher enters a Prussian school room all the boys rise and remain standing till he is seated or leaves the room.

"In my school," said Mr. Goodwin, "this want of respect of the American boy was shown in a striking way. The mayor came into the class-room one day, and not a boy got out of his seat!"

Discipline in the Prussian schools was found to be absolutely perfect. This Mr. Goodwin attributed less to the school system than to the fact that discipline is a national characteristic.

In the "gymnasien," or grammar schools, all teaching is highly specialized. The teacher of languages is not supposed to teach science, and *vice versa*.

The pupils are required to do individual work in their blank books, instead of looking at one of their number doing the work on a blackboard, as is done in this country. This result is far better and more thorough study.

The German pupil has no Saturday holiday. Formerly he had a half holiday on Wednesday and Saturday. Now he studies six days in the week, and has an average of thirty three to thirty-five class recitations a week. The school hours are from eight o'clock in the morning to six o'clock in the afternoon, though all pupils are not required to be in the room all that time. Some of them get through earlier and some later, coming in and going out through the day. After each recitation there is a recess of from five to fifteen minutes, which gives the pupils a needed rest, and enables them to attack the next lesson with renewed zeal.

Athletic training is considered of great importance, and it develops the youths physically, while giving them mental rest. They are required to attend the gymnasium (in the English sense) two and three times a week.

The only point in which the Prussian school system is inferior to that of the American school is the method of teaching physical science. They use old methods in the best Berlin schools, and do little, if any, laboratory work.

The "gymnasium" holds the place in education that is jointly occupied by the high schools and the first years of colleges in America. From it the graduate goes directly to the university. There are no "colleges" or institutions between the "gymnasium" and the university in Germany, and Mr. Goodwin thinks there should be no place for them in any complete system of education.

In every school which he examined Mr. Goodwin was impressed with the thoroughness of the work.

Prof. Wheeler True to Cornell.

ITHACA, N. Y.—Dr. Benjamin Ide Wheeler, of Cornell university, has declined the offer of the presidency of the University of Rochester. Prof Wheeler has a strong interest in Cornell, and feels his obligation to the university for its generous treatment of him. During the past year he has been a resident at the American school at Athens, and has been much interested in the excavations at ancient Corinth. He will probably make an appeal for funds to carry on the work.

Principals. Examinations.

(Questions used in recent Examinations of Applicants for Principalships in New York.)

(CONTINUED FROM LAST WEEK.)

SCHOOL MANAGEMENT.

1. Name at least four ends to be attained by skilled school management. Illustrate.

2. What conditions are essential to the health and well-being at the school? Explain.

3. Name elements of strength in a teacher that qualify him to conduct a class efficiently.

4. Classify duties of principal as to his relations to pupils, teachers, school officers, and parents.

5. Write your views on one of the following:

(*a*) A well-appointed school.

(*b*) Home study and school study by grammar pupils.

(*c*) How can a principal communicate his ideas and wishes to teachers and get their co-operation.

(*d*) Outline a plan of a series of teachers' meetings to facilitate management and promote professional spirit.

LOGIC.

(Grammar School Principals.)

(Answer any five of these questions.)

1. (*a*) When you prove that the sum of the interior angles of a triangle is equal to two right angles, what method of reasoning do you employ?

(*b*) The wise man has said: "The thing that hath been is that which shall be; and the thing that is done is that which shall be done."

What mode of reasoning did Solomon herein use? Write a short explanation of your answer.

2. What particular kind of reasoning is employed:

(*a*) In the parables of the New Testament?

(*b*) in the morals of Æsop's Fables?

(*c*) in the comparison of the history of a nation to the life of a man in respect of birth, growth, maturity, and decay?

(*d*) in the saying that lightning never strikes twice in the same place?

(*e*) in the statement that there will always be a large absenteeism of teachers whereby the pension fund can be replenished?

(*f*) in forming the wave theories of sound and light?

(NOTE.—The designation of the above methods by one generic name common to all of them will not be sufficient.)

3. "Logicians have aimed at reducing the whole of the special canons or rules of the syllogism to one comprehensive law or principle."

Enunciate the said law.

4. What is meant by

(*a*) The principle of contradiction?

(*b*) The law of excluded middle?

(*c*) Begging the question, or reasoning in a circle?

5. What is a disjointed proposition?

What is the test of the validity of a disjunction?

6. Define a conditional proposition and give the rule for determining the soundness of the conclusion derived from it.

7. What rule or canon is applicable to the following syllogism,

The wise in heart will receive commandments.

John is not wise in heart.

Therefore John will not receive commandments.

8. State the canons or rules that are employed in testing the validity of a syllogism.

CIVIL GOVERNMENT.

Define civil government; republic; constitution; writ of habeas corpus; impeachment; "ratio of representation" as used in the constitution.

State the defects of the Articles of Confederation.

What is the composition of the legislative department of the federal government? Give the qualifications of members, terms of service; how chosen. Arrange answer in tabular form.

Describe the three ways by which a bill may become a law.

Name the powers denied by the constitution to Congress and those denied to the states.

Describe in full the manner of electing the president and vice-president.

To what cases do the judicial powers of the United States extend?

PSYCHOLOGY.

1. Define psychology. Mental phenomena. Judgment.

2. Name methods that may be employed in psychology.

3. Distinguish between empiric and rational psychology.

To which should teachers give special attention, and why?

4. Name general powers of the soul, and briefly define each.

5. Distinguish between percept and concept.

6. What is imagination? How does it differ from phantasy?

7. Show by illustration how imagination may be profitably used n education.

8. Give general rule for memory. What is the relation of interest, attention and memory?

9. When do children begin to reason? How do they show that they reason?

10. How is the will trained in the process of learning to write?

LITERATURE.

1. Name authors of the following:

Wreck of the Hesperus; Snow-Bound; House of Seven Gables; Chambered Nautilus; Alexander's Feast.

State one or two facts concerning the life of each of the authors named.

2. State in a sentence or two the chief literary characteristics of the following works naming author: Essay on Man, Marmion, Tam O'Shanter, The Newcomes, Gulliver's Travels.

3. Give a brief account of the rise and development of American literature.

4. State briefly how English classics should be taught and studied in a grammar school course.

5. What would you teach in the following selection? And how?

> And ever, against eating cares,
> Lap me in soft Lydian airs,
> Married to immortal verse—
> Such as the meeting soul may pierce
> In notes with many a winding bout
> Of linked sweetness long drawn out.
>
> —*Milton L'Allegro.*

RHETORIC.

1. How does rhetoric differ from grammar? What is the test of good English?

2. Define perspicuity; solecism; paraphrase; force; tautology.

3. Give an example of a loose sentence; a periodic sentence. Re-write the following in periodic form: We came to our journey's end at last with no small difficulty.

4. Point out and name the figures of speech in the following:

(*a*) Thirty sail were seen on the lake.

(*b*) Deeds show what we are; words, what we should be.

(*c*) The waves ran mountains high.

(*d*) The winds go howling through the night.

(*e*) Build thee more stately mansions, O my soul!

5. Point out and explain noteworthy rhetorical features in the following:

(*a*) So wrangled, bangled, jangled they a month.—*Browning.*

(*b*) Softly sweet in Lydian measures.—*Dryden.*

(*c*) This is the forest primeval.
The murmuring pines and hemlocks.—*Longfellow.*

(*d*) When Ajax strives some rock's vast weight to throw,
The line, too, labors, and the words move slow.—*Pope.*

(*e*) The lisp of the leaves and the ripple of the rain.
—*Swinburne.*

To Educate the Mothers.

Miss Julia Richman, of grammar school No. 77, has evolved a plan which is likely to bring the school and home into closer relations. Realizing that many mothers had a very crude idea of the training of children, Miss Richman singled out some cases of inattention to the welfare of the children, and called on the mothers. She found them almost entirely ignorant of the ordinary laws of hygiene, and she began to give talks on this subject to the mothers of the district who would come to her. These talks appealed so strongly to common sense that she soon had a large attendance.

As the work has been understood and appreciated, Miss Richman has enlarged its scope, and has called on others to help her. All of the work of her aids, including all the woman teachers in her school and outside specialists, has been done without recompense and outside of school hours.

Miss Richman has her plans carefully formulated. Lectures and addresses will be given every two weeks till February. Dr. Jenny B. Merrill gave the first lecture of the course, on "Proper Home Amusements for Children," a subject suggested by the mothers. Other subjects are "Throat and Nasal Troubles," by Dr. S. Goldstein; "What Children Should Read," by Miss Theresa Hitchler, chief cataloguer of the Free Circulating Library, and "What to Do With the Girls of the Poorer Classes Who Have Received a Public School Education," by Dr. Henry M. Leipziger, of the board of education.

The last subject Miss Richman considers one of the most important which can come up in public school matters. Young girls, children of illiterate parents, who have received a good common school education, are often so far above those parents intellectually that they are almost without restraint or government and this condition furnishes one of the serious problems which workers in the tenement house districts have to consider.

That Troublesome Manitoba Question.

TORONTO, ONT.—The long vexed Manitoba school question, which caused the defeat of the Conservative government, with Sir Charles Tupper as premier, after it had been in power for eighteen years, has been finally settled by the Laurier liberal administration. The Manitoba provincial government abolished state-aided Roman Catholic public schools in the Northwest. The Catholics held that these schools were guaranteed to them by the treaty of Paris and the constitution of Canada. The Catholic right to these schools was disputed on the ground that Manitoba was not a part of Canada when the constitution was drawn up, and the highest courts supported this content on, but held that the federal authorities could grant the Catholics remedial legislation, and it was the fact that Tupper proposed to pass remedial legislation and force Catholic public schools on the Protestant majority of Manitoba that caused the defeat of his government in last June

The basis of settlement by the Liberals has not yet been published, but it is known that it is acceptable to the Manitoba government and will be doubtless well received by the majority of the Catholics in Canada It will provide for national undenominational schools in Manitoba and will make provision for allowing clergymen of any recognized Christian church visiting the schools, after school hours, to instruct and give such religious instruction to the pupils as is approved by their parents.

Later.—It is learned that the Protestant leaders strongly protested against this concession, which they considered a violation of the national school principles. The premier had to withdraw from the agreement, and, so far as can be learned, the matter is as far from settlement as ever.

Brief Notes of General Interest.

A new departure of great importance has been begun in Chicago, under the auspices of the Chicago Institute of Education. Through its executive committee it has appointed a committee of sixty city teachers to carry on a plan of systematic outdoor work or field work in connection with nature study. On September 19 the organization was made a permanent one, by the election of officers It was provided also that the work be carried on through nine sub-committees, as follows: 1. Executive committee, and committees on maps, syllabi, libraries, instruction and school exhibits, public information, transportation finance, and a conference committee. Mr. Wilbur F. Jackman, of the Chicago normal school, is president of the committee of sixty.

A fuller description of this movement will be given next week.

Prof. Tarr, of Cornell university, who is just back from his summer in Greenland, congratulates himself on being the only geologist who has ever seen the entire Labrador coast from end to end. The *Hope*, in which he sailed, kept within sight of land all the way from Newfoundland to Hudson straits, going very slowly because of the ice, and there was only about one hour's darkness during the entire fortnight consumed in this way. Prof. Tarr has enjoyed such an advantage once before, when he was on the United States Geological Survey. He was assigned a task which necessitated his driving across the state of Texas along the line of greatest width, a distance of 1,500 miles.

D. M. Browning, commissioner of Indian affairs, reports that there has been a steady progress in education and civilization among the redmen during the past year. The main effort now is, and for many years must be, to put the Indian upon his allotment, get him to support himself there, protect him from encroachment and injustice, and educate and train his children in books and industries. The government will assist in making Indians practical farmers. Reports from the agencies show that Indians earn their living in many ways—raising crops, raising and selling live stock, working in the woods, and on irrigating ditches, etc. The commissioner urges the passage of the bill now pending in Congress to prohibit the sale of liquor to Indians who have become citizens.

The Cornell university campus is to have a new gateway at its entrance, given by the Hon. Andrew D. White, of the United States Venezuelan Commission. The gateway, which it is estimated will cost $3,000, is designed by Architect W. H. Miller, of Ithaca. It is to be built of alternate courses of Ohio sandstone and limestone. The roadway opening, seventeen feet in width, runs between piers twenty five feet high, and is flanked by footway openings seven feet in width. Tablets let into the centers of the wing walls are inscribed respectively, "So enter that daily thou mayst become more learned and more thoughtful; so depart that daily thou mayst become more useful to thy country and to mankind," this being the translation of the inscription on an old Italian gateway; and, "The Lord bless thy going out and thy coming in from this time forth forevermore."

PADUCAH, KY.—Supt. Rouse calls especial attention to the need for supervision of pupils' reading. To this end many of the teachers have had book-cases placed in their rooms and have taken books to school, and have encouraged their pupils to bring as many as they could The superintendent advises that the board of education donate at least $5 00 per year to each room for a book fund, the books to become the permanent property of each room. One teacher who followed the above plan took at the beginning lists of books read by her pupils. A second list taken at the end of the year showed a great improvement in the character of the books read.

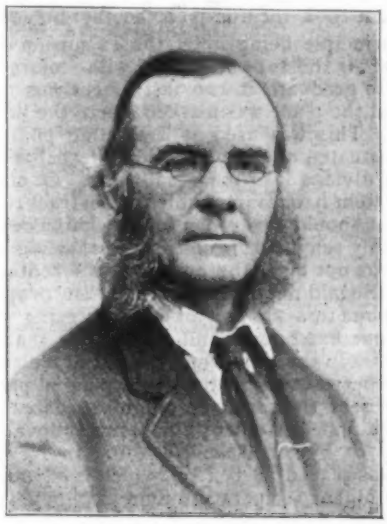
John MacMullen.

John MacMullen, whose death occurred Sept. 12, was born in New York in 1818, and was graduated from Columbia college in 1837. Before leaving college he began to teach, and he then made a firm resolve to devote his life to improving the minds and characters of young people.

In order to prepare himself for this work, he made a tour of Europe on foot, visiting the British Isles, France, Germany, Switzerland, Italy, and Greece.

During the revolution of 1848 he was in Paris and saw some of the street fighting. He was in the Tuileries three hours after it was vacated by Louis Philippe.

In 1850 Mr. MacMullen carried out his design for opening a school for boys. It was located on lower Broadway and was limited to forty-five pupils. He introduced original designs which have since been adopted into many schools and colleges. The pupils governed themselves, by means of a court of five boys who decided on all cases in which a student felt dissatisfied with the principal, a teacher, or another pupil. Two of the judges were selected by the principal, two by the pupil who made the complaint, and one by the four other members of the court.



JOHN MACMULLEN.

Mr. MacMullen gave gymnasium drills and instruction in carpentry, single stick, boxing, and fencing, and encouraged outdoor play and sports in the warmest manner. Excursions of his students to the country, to the shipping in the harbor, to quarries, and all kinds of outdoor places of interest, with himself as a guide, were a regular institution. He had imitation money printed and taught the boys to run a bank with it, giving instruction by actual practice in banking, bookkeeping, and business methods generally, long before business colleges began to flourish. Military drill was a feature of the MacMullen school, and the principal carried out his policy of making the school self-governing by appointing one student an officer of the day, whose orders were law.

Among the many pupils of Mr. MacMullen were ex-Mayor Abram S. Hewitt, George Haven Putnam, Nicholas Fish, Samuel Borrowe, and his son, Hallett Alsop Borrowe, W. Bayard Cutting, Alfred R. Conkling, James A. Roosevelt, Lyman Rhodes, and William Waldorf Astor. Among those who had their sons and other relatives educated by Mr. MacMullen were the Rev. Morgan Dix, D. D., Secretery of State Hamilton Fish, Peter Cooper, and Dorman B. Eaton.

Greatly interested in the independence of the Greeks, Mr. MacMullen got up meetings to help their cause. He took a similar interest in the movement of Garibaldi, and contributed time and money to the Italian cause.

Mr. MacMullen was for two years librarian of the New York Society Library, and he was one of the founders of the Washington Heights Free Library, organized in 1871. On giving up his school in 1893, he took charge of the compiling and arranging of the old records of Columbia college.

Mr. MacMullen was for forty years a member of the Century Club, and belonged to the New York Geographical Society and the New York Historical Society.

Topic Exercises.

(These exercises are to be read once with care, and when topics are called for a pupil passes to the platform and gives it in an easy fluent manner with appropriate gestures. It is desirable that he should rehearse it before delivery.

The Story of the Thermometer.

By James C. Moffet.

The thermometer was made in 1621 by a Dutch physicist named Cornelius Van Drebbel, and consisted of a tube filled with air closed at its upper end and dipping at its other extremity—which was open—in a bottle of nitric acid diluted with water. As the temperature rose or fell, the air in the tube increased or grew less in volume, and consequently the liquid descended or rose. This instrument is now known as an air thermometer, but as its measurements were based on no fixed principle it was of little use.

Thirty years after the introduction of Van Drebbel's "indicating glass" certain Walian scientists improved it so that it took the form of the thermometer of to-day, its principle being upon the expansion of liquids. Instead of air the tube was filled with colored alcohol. In order to graduate it the instrument was taken to a cellar, and the place was marked where the liquid came to a rest. This was used as a starting point, and the portions situated above and below the cellar temperature were divided into 100 equal parts. Of course with such a system it was impossible to construct two instruments that should agree. Yet for one half a century this was the only temperature measurer that was made use of, as it was not until the end of the seventeenth century that Renaldini, a Venetian scientist, proposed that all thermometers should take the freezing degree of water as one fixed point, and as another, that to which alcohol rises in the tube when dipped in melted butter, the space between to be divided into equal parts.

The present thermometer, therefore, dates from this period, the first instrument due to this innovation being made in 1701 by Sir Isaac Newton. In Newton's apparatus was placed linseed oil, which is capable of supporting a higher temperature than alcohol without boiling.

In 1714 the mercurial thermometer that is used to-day throughout the English-speaking world was invented by Gabriel Fahrenheit. In Germany, however, the scale of Réaumur, introduced in 1730, is most popular, while that of Celsius, which appeared a decade later, is the standard in France. These three instruments differ only in graduation. In the scale of Fahrenheit the freezing point is marked at 32 degrees while the boiling point is indicated at 212. Réaumur and Celsius more scientifically took the freezing point as zero. Boiling point, according to Réaumur is 80, but Celsius placed it at 100, and it is therefore known as the Centigrade scale. Scientific men throughout the world have adopted the latter almost exclusively now, and it is thought that some day its use will become universal.

1. Write ten questions on the above, whose answers will tell the substance of the story.

2. Answer your own questions, with as little reference to the text as possible.

The Cinchona Tree.

(From a lecture by Dr. Robert G. Eccles.)

The native home of the cinchona tree, from which quinine is obtained, is in the Andean slopes in South America, not far from the equator. The habitat of these trees is a region of perpetual fog and drizzle. For nine months of the year scarcely a ray of direct sunlight reaches them, and during the other three there is a chasing of clouds and sunshine hour by hour during the day, much like our April weather. It is an ideal home of malaria unfit for human habitation. In those years when the fogs are densest and the sunshine least, the yield of quinine from the bark is known to be greatest. What other conceivable function can this quinine serve the tree than as a destroyer of malaria germs. It is only found in abundance in the parts of the tree likely to be subject to their attacks. It multiplies under the very conditions that multiply the germs, and that would therefore make them more dangerous to the plant. The home of the tree is the natural home of such germs. In India, where cinchona is now artificially cultivated, they cover the bark of the growing trees with cotton and shield them from direct sunlight, the year they are going to strip them, having found experimentally that this treatment increases the quinine yield very markedly. Before they adopted this plan the yield was discouragingly small and becoming smaller. Now it compares favorably with that from wild trees in South America. By such treatment they imitate in a measure the conditions of their original home, and the very conditions that indicate danger from germs to the tree.

Read up "Cinchona" in the dictionary and encyclopedia. Then write a composition upon it, arranging what you have learned in your own way.

Pins.

Pins claim a very high antiquity, the earliest form being the natural thorn, which is still used to some extent by the present women of Upper Egypt. In prehistoric times pins were also made of small bones of fish and animals. Among the remains of the lake dwellers of Europe have been found bronze pins and bronze brooches, in which the pins form the prominent feature many of which are highly ornamented and very beautiful. A few copper and one iron pin have also been found. It is estimated that 10,000 pins have been collected at the lacustrine station in Switzerland alone. A few of these pins have double stems, and were probably used as hairpins. Three have been found at Peschiera, which are exactly the same in form as the safety pin of the present time. Among the single-stem pins are many ingenious devices for preventing the spike from passing entirely through the cloth or other material it is used for fastening together. Many of them are so formed that they are thicker in some places than in others. A large number, both of bronze and bone, have the head formed by a loose ring passed through an eye in the pin. A few heads have been discovered, while in ancient Rome bronze pins and bone hairpins, with ornamental heads, have been discovered among relics of Pompeii.

In England an act of parliament passed in 1483 prohibited the importation of pins. Pins were introduced from France into England in the latter part of the fifteenth century by Catharine Howard, Queen of Henry VIII.

Parliament in 1543 passed an act providing that "no person shall put to sale any pins but such as shall be double-headed and have the heads soldered fast to the shanks of the pins, well smoothed, the shanks well shapen, the point well rounded, filled, canted and sharpened."

John Tilsby began the manufacture in Gloucestershire. His business grew to such an extent that it is said he gave employment to 1,500 persons; his pins, Stroud pins, as they were called, gained a high reputation. In 1636, the manufacture was introduced into Bristol and Birmingham, the latter place ultimately becoming the great center of the industry.

In America, in 1775, a prize was offered to the maker of native pins. Carolina introduced the first manufacture. During the war of 1812, owing to the restrictions upon commerce, the price of pins rose to $1 per paper. The making of them was not fairly started in this country until the year 1836.

The early pins in this country were made with globular heads of fine twisted wire, made separately and secured to the shank by compression from a falling block. These old pins had the misfortune of often parting with their heads. The solid-headed pin in common use to-day took the place of the old form about 1840.

Before the introduction of machinery, pins were made by manual labor in such a way as to require their passage through the hands of fourteen different persons before completion. By machinery in use at the present time, it is estimatsd that 160 pins are turned out per minute. In England 50,000,000 pins are made daily, of which 37,000,000 are made in Birmingham alone. Connecticut is the principal center of the industry in the United States.

Nature Poems.

Thistle Sermons.

Pray let the gaudy tulip go
For Scotland's flower with crimson crest,
That wears a bee on every blow
And bristles like a bandit dressed;
That drifts its silver light balloon
Along the year's dull afternon
Bound for another spring, and girds
The feeble heart like holy words.

Just as the seeds are fit to fly
A yellow bird drops deftly down,
A living nugget from the sky,
And lights upon the thistle brown.
And then as if the golden head
Were shaking up its feather bed,
A little breathless tempest breaks
About the bird in silver flakes,

A cunning cloud of flock and fleck—
Alas! the thistle is a wreck!
But no, the seeds are taking wing
The goldfinch has no time to sing
For taking toll, and then the gale
Sweeps out the fleet of silk and sail,
And so, the weeds are always here,
And finches dine another year,
And so, O troubled soul, good cheer.

—*Benjamin F. Taylor.*
(Dulce Domum)

A Lonely Thanksgiving Dinner.

1. What day is it in the picture? 2. What has the boy for dinner? 3. Why is he eating on the door-step? 4. What do you think his home is like? 5. Does he look well and happy? 6. What is he thinking about? 7. Will he always be poor? 8. What is the little girl thinking about? Write a story about the picture.

When the Cows Come Home.

With klingle, klangle, klingle;
Way down the dusty dingle,
The cows are coming home.
How sweet and clear and faint and low,
The airy tinklings come and go,
Like chimings from some far-off tower,
Or patterings of an April shower
That makes the daisies grow;
Koling, kolang,
Koling, kolang, kolinglelingle,
Way down the darkening dingle
The cows come slowly home;
And old-time friends and twilight plays,
And starry nights and sunny days,
Come trooping up the misty ways,
When the cows come home.

With jingle, jangle, jingle,
Soft tones that sweetly mingle,
The cows are coming home.
Malvine, and Pearl, and Florimel,
DeKamp, Red Rose, and Gretchen Schell,
Queen Bess, and Sylph, and Spangled Sue—
Across the fields I hear her loo-oo,
And clang her silver bell;
Go-ling, go lang,
Go-ling, go lang, golinglelingle,
With faint, far sounds that mingle,
The cows come slowly home;
And mother-songs of long gone years,
And baby joys and childish tears,
And youthful hopes and youthful fears,
When the cows come home.

With ringle, rangle, ringle,
By twos and threes and single,
The cows are coming home;
Through violet air we see the town,
And the summer sun a slipping down
The maple in the hazel glade;
Throws down the path a longer shade.
And the hills are growing brown:
To-ring, to-rang,
To-ring, to rang, toringlelingle
By threes and fours and single,
The cows come slowly home;
The same sweet sound of wordless psalm,
The same sweet June-day rest and calm;
The same sweet scent of bud and balm,
When the cows come home.

With tinkle, tankle, tinkle,
Through fern and periwinkle,
The cows are coming home;
A-loitering in the checkered stream,
Where the sun-rays glance and gleam;
Clarine, Peachbloom, and Phœbe, Phyllis
Stand knee deep in creamy lilies,
In a drowsy dream;
To link, to-lank,
To-link, to-lank, to-linklelinkle,
O'er banks with buttercups a-twinkle,
The cows come slowly home;
And up through memory's deep ravine
Come the brook's old song and its old-time sheen,
And the crescent of the silver queen,
When the cows come home,

With klingle, klangle, klingle,
With loo-oo and moo oo, and jingle,
The cows are coming home;
And over there on Merlin hill
Hear the plaintive cry of Whip-poor-will
The dew-drops lie on the tangled vines,
And over the poplars Venus shines,
And over the silent mill
Koling, kolang,
Koling, kolang, kolinglelingle,
With a ting-a-ling and jingle,
The cows come slowly home;
Let down the the bars; let in the train,
Of long-gone songs, and flowers, and rain,
For dear old times come back again
When the cows come home.

—*Mrs. Agnes E. Mitchell.*

Good-bye, Little Flowers.

Hark! through the pine boughs
  Cold wails the blast.
Birds south are flying,
Summer is dying,
  Flower time is past.

Cold are November skies,
  Sunless and drear.
Goldenrod, eyelids close;
Aster, tuck in your toes;
  Winter is here.

"Good-bye, little flowers!"
  The icy winds sing;
Snow, blanket them over;
Sleep well, little clover,
  Sleep till the spring.—*Sel.*

Indian Summer.

The old gray year is near his term in sooth,
  And now with backward eye and soft-laid palm
Awakens to a golden dream of youth.
  A second childhood, lovely and most calm;
And the smooth hour about his misty head
  An awning of enchanted splendor weaves
Of maples amber, purple, and rose-red,
  And droop limbed elms down-dropping golden leaves.
With still half-fallen lids he sits and dreams
  Far in a hollow of the sunlit wood,
Lulled with the murmur of thin-threading streams,
Nor sees the polar armies overflood
The darkening barriers of the hills; nor hears
The north wind ringing with a thousand spears.

—*Archibald Lampman*, in *Scribner's Magazine.*

Thanksgiving Joys.

Cart-loads of pumpkins as yellow as gold,
  Onions in silvery strings,
Shining red apples and clusters of grapes,
  Nuts and a host of good things,
Chickens and turkeys and fat little pigs,—
  These are what Thanksgiving brings.

Work is forgotten and play-time begins;
  From office and school-room and hall,
Fathers and mothers and uncles and aunts,
  Nieces and nephews, and all
Speed away home, as they hear from afar
  The voice of old Thanksgiving call.

Now is the time to forget all your cares,
  Cast every trouble away;
Think of your blessings, remember your joys.
  Don't be afraid to be gay!
None are too old and none are too young
  To frolic on Thanksgiving day.

—*Youth's Companion.*

A Problem.

"I wonder," said Teddy, one sunny day,
  As he gazed at the meadow, with thoughtful frown,
"Why the grass is so pretty so green and so bright,
  When it comes from the earth, so dirty and brown!"
With a look of surprise in her great blue eyes,
  "Why, don't you know?" cried small Katrine.
"The sun is *yellow*, the sky is *blue*,
  And that is the reason the grass is green."

—*Esther W. Buxton*, in May *St. Nicholas.*

The Squirrel's Arithmetic.

High on the branch of a walnut tree
  A bright-eyed squirrel sat.
What was he thinking so earnestly?
  And what was he looking at?
The forest was green around him,
  The sky all over his head;
His nest was in a hollow limb,
  And his children snug in bed.

He was doing a problem o'er and o'er,
  Busily thinking was he;
How many nuts for his winter's store
  Could he hide in the hollow tree?
He sat so still on the swaying bough
  You might have thought him asleep.
Oh, no; he was trying to reckon now
  The nuts the babies could eat.

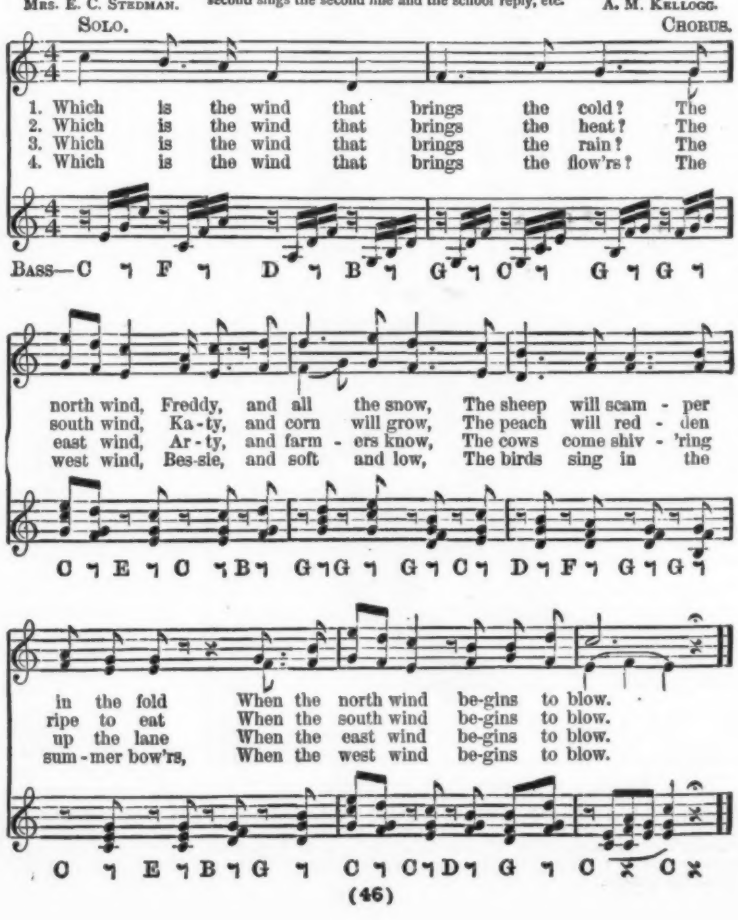
Then suddenly he frisked about,
  And down the tree he ran.
"The best way to do without a doubt,
  Is to gather all I can."

—*Annie Douglas Bell.*

Which is the Wind?

Let four pupils stand on the platform; one sings the first line, the rest of the school reply; the second sings the second line and the school reply, etc.

Mrs. E. C. Stedman. A. M. Kellogg.



Special Day Exercises.

Thanksgiving Quotations.

Arranged by E. M. C.

The following quotations may be used for a Thanksgiving exercise, each pupil in turn stepping to the platform and giving one.

The school-room should be trimmed as prettily as time and circumstances will allow. Flags may be draped on the wall, and bunches of golden-rod and autumn leaves hung over the windows and doors. Baskets of grapes and apples, pumpkins, melons, sheaves of wheat and ears of corn may be tastefully arranged. The word Thanksgiving may be made out of leaves or evergreens and placed where all can see it. The exercise should begin with an opening song.

Singing, "The breaking waves dashed high."

First Pupil:—

1. There was a great deal of religious persecution in England during the Seventeenth century. Among those who suffered were the Puritans. They were members of the church of England who disliked some of its forms and ceremonies and tried to make a change in them. They were called in derision "Puritans," because they sought to lead more Godly lives than those who differed with them.

On account of the persecutions, many of the Puritans settled in Holland; but only for a short time; a number of them returned to Plymouth, England, from which port 102 men, women, and children set sail for America in the ship *Mayflower*.

It was late in the autumn when they started, and when they sighted the bleak shores of Cape Cod where they landed it was December 21, 1620. The Pilgrims, as they were called because of their wanderings, were sturdy, resolute people who were willing to face any danger for the sake of what they believed to be their duty.

—From *Epochs in American History*, by Edward S. Ellis, A.M.

2. "The Pilgrim Fathers, after ten months of sickness and suffering, gathered in their first harvest which consisted of twenty acres of corn, and six of barley and peas, enough to keep them supplied with food for the coming year. For this they devoutly thanked God and made preparations for a feast. Hunters were sent out to procure the Thanksgiving dinner, and returned with water-foul, wild turkey, and venison. Then the feast was prepared and Massasoit and ninety of his warriors were present. On the following year there was such a long drought that the corn and barley were stunted, and famine seemed to stare the pilgrims in the face. A day of fasting and prayer was appointed, and for nine hours the people prayed unceasingly. At evening the sun set in clouds, a breeze sprang up, and in the morning the rain was pouring down. The crops revived and there was a bounteous harvest. For this a day of thanksgiving was ordered by Governor Bradford."

Second Pupil:—

THE FIRST THANKSGIVING DAY, A. D., 1622.

"And now," said the Governor, gazing abroad on the piled-up store
Of the sheaves that dotted the clearings and covered the meadows o'er
"'Tis meet that we render praises because of the yield of grain;
'Tis meet that the Lord of the harvest be thanked for His sun and rain,
"And therefore, I, William Bradford (by the grace of God today,
And the franchise of this good people), Governor of Plymouth, say,—
Through virtue of vested power,—Ye shall gather with one accord,
And hold in the month November, Thanksgiving unto the Lord.

* * * * *

'So shoulder your matchlocks, masters; there is hunting of all degrees;
And, fishermen, take your tackle and scour for spoil the seas;
And maidens and dames of Plymouth, your delicate crafts employ
To honor our First Thanksgiving, and make it a feast of joy.

—*Margaret J. Preston.*

Third Pupil:—

During the revolution, a day of national thanksgiving was annually recommended by Congress. After the constitution was adopted, Washington appointed such a day, and several other presidents did the same. In 1863 Lincoln made a proclamation for national observance, and since then a proclamation has been issued each year, the last Thursday in November being set aside as Thanksgiving.

Fourth Pupil:—

The president proclaims that thus
His duty does direct;
The governor has written us
Unto the same effect;
Now let the housewife's nets be cast,
And all the poultry kind
Begin to realize at last,
For what they were designed

* * * * *

The blessings of this day do not
Secure a future one;
This is to thank the Lord for what
He has already done. —*Will Carleton.*

Fifth Pupil:—

Other nations kept a day of thanksgiving.

The Jewish feast of Tabernacles was a thanksgiving day. For eight days the people did not work, but spent their time eating and drinking. During this they lived in booths made of branches of trees, and great public ceremonies were held, besides the worship and sacrifices of each household.

The ancient Greeks held a great festival in honor of Demeter, the goddess of the harvest and the Romans also held a feast after harvest. Both Greeks and Romans held their festivals in September. They had games and sports in the fields, and crowned their household god with flowers!

THANKSGIVING DAY.

Sixth Pupil:—

Over the river and through the wood
To grandfather's house we go
The horse knows the way to carry the sleigh
Through the white and drifted snow.
Over the river and through the wood
Now grandmother's cap I spy!
Hurrah for the fun! Is the pudding done?
Hurrah for the pumpkin pie!

—*Lydia Maria Child.*

Seventh Pupil:—

The king and high priest of all festivals was the Autumn Thanksgiving. When the apples were all gathered and the cider was all made, and the yellow pumpkins were rolled in from many a hill in billows of gold, and the corn was husked and the labors of the season were done, and the warm, late days of Indian summer came to crisp the ground of a morning, but with warm traces of benignant sunny hours at noon, there came over the community a sort of genial repose of spirit—a sense of something accomplished, and of a new golden mark made in advance,—and the deacon began to say, to the minister, of a Sunday, "I suppose it's about time for the Thanksgiving proclamation."

—*Harriet Beecher Stowe*, in *Old Town Folks*.

Eighth Pupil:—

For the wealth of pathless forests,
Whereon no axe may fall;
For the winds that hunt the branches;
The young bird's timid call;

For the red leaves dropped like rubies
Upon the dark green sod;
For the waving of our forests,
We thank thee, O Our God.

—Adapted from *Lucy Larcom*.

Ninth Pupil:—

O fruit loved of boyhood! the old days recalling,

When wood-grapes were purpling and brown nuts were falling!
When wild, ugly faces we carved in its skin,
Glaring out through the dark, with a candle within!
When we laughed round the corn-heap, with hearts all in tune,
Our chair a broad pumpkin, our lantern the moon,
Telling tales of the fairy who traveled like steam,
In a pumpkin-like coach, with two rats for her team!
—*Whittier.*

The fruit trees have for a long time been whispering to the birds that the harvest-time has come. Have you heard their songs of thanksgiving? Through the summer the apple-tree has joyfully been breathing its thanks to its feathered friends for keeping away the insects, and to the wind and rain and sunshine for their bounty; now it as joyfully gives as it has received, and the air is filled with its invitation to a Thanksgiving dinner.
—*Olive M. Long*, in *The Gifts of the Year.*

As flowers carry dewdrops, trembling on the edges of the petals, and ready to fall at the first waft of wind or brush of bird, so the heart should carry its beaded words of thanksgiving; and at the first breath of heavenly flavor, let down the shower perfumed with the heart's gratitude. —*H. W. Beecher.*

Some hae meat that canna eat,
And some would eat that want it;
But we hae meat, and we can eat,
Sae let the Lord be thank't. —*Burns.*

A thankful heart to God for all His blessings is the greatest blessing of all. —*R. Lucas.*

Let never day nor night unhallowed pass,
But still remember what the Lord hath done.
—*Shakespeare.*

The private blessings—the blessings of immunity, safeguard, liberty, and integrity,—which we enjoy, deserve the thankfulness of a whole life. —*J. Collier.*

What is the best day in November?
It is the Puritan's Thanksgiving Eve;
And gathered home, from fresher homes around,
The old man's children keep the holiday—
In dear New England since the Fathers slept—
The sweetest holiday of all the year.
—*J. G. Holland.*

School singing "America."

A Christmas Re-Union.

By M. D. STERLING.

CHARACTERS REPRESENTED. *Father Christmas*, a large boy dressed in long belted robe; he carries a staff, and wears a white wig and beard. *Mother Goose*, a tall girl wearing a peaked soft hat tied over an old lady's frilled cap; also neck kerchief and apron; spectacles on nose, and a broom of twigs, such as street cleaners use, complete her costume. *Mother Goose's Son Jack and her Children*, may be costumed according to the pictures in any good illustrated copy of "Mother Goose." The *Children of the Nations* are sufficiently represented by boys and girls each carrying one of the flags of all nations, but elaborate costumes in keeping with the national character may be used, if desired. *Thanksgiving* and *Happy New Year*, large girls in white Grecian dresses, flowing sleeves; their children, *Peace* and *Plenty*, *Good Resolutions* and *Hope* are represented by smaller girls in white, *Peace* carrying an olive branch, *Plenty* a cornucopia, *Good Resolutions* a diary and pen, and *Hope* wearing a wreath of golden stars and carrying a gilt anchor (cut from heavy cardboard); *Santa Claus*, a stout, roly-poly boy, if possible, wearing a long overcoat flaked with cotton (to represent snow) and a round fur cap and mittens; an empty pack should hang carelessly from one shoulder.)

Enter FATHER CHRISTMAS *and* MOTHER GOOSE, *arm in arm.*

(*While conversing, they walk up and down the platform. At the end of Mother Goose's second speech, they seat themselves in two large armchairs, which should be ready, in middle of platform.*

Mother Goose.—

Well, well, Father Christmas, I'll do as you say,
And put off my trip for the frolic to-day.
Your thought of a Christmas re-union is fine,
For all of our relatives—yours, sir and mine;—
So, though greatly disposed at this season to wander,
Afloat in the air on my very fine gander,
Instead of such exercise, wholesome and hearty,
I've come with great pleasure to your Christmas party.

Father Christmas (*bowing*).

Thanks, thanks, Mother Goose, for the honor you pay
To me, your old friend now this many a day.
Tho' we may not, of course on all questions agree,
We're alike in our love for the children, you see;
To give them delight is our greatest of pleasures,
And freely we share with them best of our treasures;
Our energies each of us constantly bends
To keep our loved title "The Children's Two Friends."

Mother Goose.—

Ah, yes, Father Christmas, my jingles and rhymes,
The boys and girls know in far separate climes,
And sometimes I think that your son Santa Claus
Earns me more than my share of the children's applause;
For wherever he goes with his wonderful pack
Santa always has some of my books on his back;
When from Christmas Eve dreams children's eyelids unloose
Oft they find in their stockings my book "Mother Goose."

Father Christmas.—

'Tis true, my dear madam, that I and my son
Respect most profoundly the work you have done.
The boys from our store-rooms in Christmas-Tree Land,
Get the bonbons we make on the Sugar-Loaf Strand;
The children enjoy them,—I cannot deny it,—
But still need your writings as part of their diet;
Your rhymes, wise and witty, their minds will retain
When their toys and their candy are done,—that is plain!

(Enter Jack, the son of Mother Goose. He carries a large golden egg.)

Jack.—Oh, there you are, Mother Goose, hobnobbing with Father Christmas! My goose must have known there was going to be a reunion of the Goose and Christmas families! She was so obliging as to lay another egg in honor of the occasion. You shall have it, Father Christmas, and may good luck go with it. (*Hands egg.*)

Father Christmas.—Thank you, Jack. That's a present worth having! I wish my son, Santa Claus, had as fine a gift to put in every poor body's stocking. He is out on his rounds now, but expects to be back, as he said, "before the fun begins."

Jack.—Santa's always ready for fun!

Mother Goose (*taking Jack's hand, as he stands beside her*).—

"This, my son Jack,
Is a smart-looking lad;
He is not very good,
Nor yet very bad."—(*Sound of voices outside.*)

Jack.—Dear me, mother! I can't stir without those young ones following me! (*Sound of voices and knocking.*)

Children outside.—Jack! Jack!

Jack (*calling.*)—All right. Come in. I'm here, and Mother Goose and Father Christmas, too. Surprise us all by being good, won't you?

Enter, two by two, Little Bopeep, with a bundle of lamb's wool suspended from her shepherdess crook; Little Jack Horner, carrying carefully a deep pan covered with paper pie crust; Little Miss Muffett, carrying a bowl and spoon; Peter Pumpkin Eater, with a pumpkin under his arm; Curly Locks, with a piece of needlework; Little Boy Blue, with a Christmas horn; Contrary Mary, with string of bells for bracelets, and carrying shells; Little Tommy Tucker, with a sheet of music; Jack and Jill, carrying a pail; Simple Simon, finger in mouth, looking as idiotic as possible; Polly Flinders, in a torn dress, sprinkled with ashes. The children march and countermarch to music around Mother Goose and Father Christmas, bowing as they pass them. When Mother Goose claps her hands the children group themselves on her side of platform, not in a stiff row but as naturally as possible. As one after another comes forward for his or her speech, the others appear to be conversing among themselves, making the by-play in keeping with their characters.

Mother Goose.—Tell Father Christmas your names now, my pretty ones, and give him the presents you have brought in his honor.

Little Bo-Peep (*coming forward*).—I'm Little Bo-Peep who lost her sheep. I bring you some fine lamb's wool to keep you warm, Father Christmas. (*Father Christmas receives with a gracious air this gift and those that follow, handing them afterward to Jack Goose, who puts them into a large box or basket previously provided for the purpose*).

Jack Horner.—I'm little Jack Horner who sat in a corner, eating a Christmas pie. I've brought you one just like it, Father Christmas. This pie is full of plums, and I haven't put in my thumb to pull out one! (*Goes back to place after handing pie.*)

Miss Muffett.—I'm little Miss Muffett, sir. I sat on a tuffett, eating some curds and whey; but there came a big spider, and I was frightened away. Do you like curds and whey, Father Christmas? I hope so, for here are some in a bowl. (*Hands gift, and returns to place.*)

Peter Pumpkin-Eater.—Here come I. Peter, Peter, Pumpkin-Eater. But I've saved a nice pumpkin for *you*, Father Christmas, and here it is. (*Returns to place.*)

Curly Locks.—Just little Curly Locks who sits on a cushion, and sews a fine seam, and feeds upon strawberries, sugar, and cream! Here's some of my sewing, Father Christmas. (*Presents needlework and returns to place.*)

Enamel

5

Dentine

Pulp Cavity

4 Enamel

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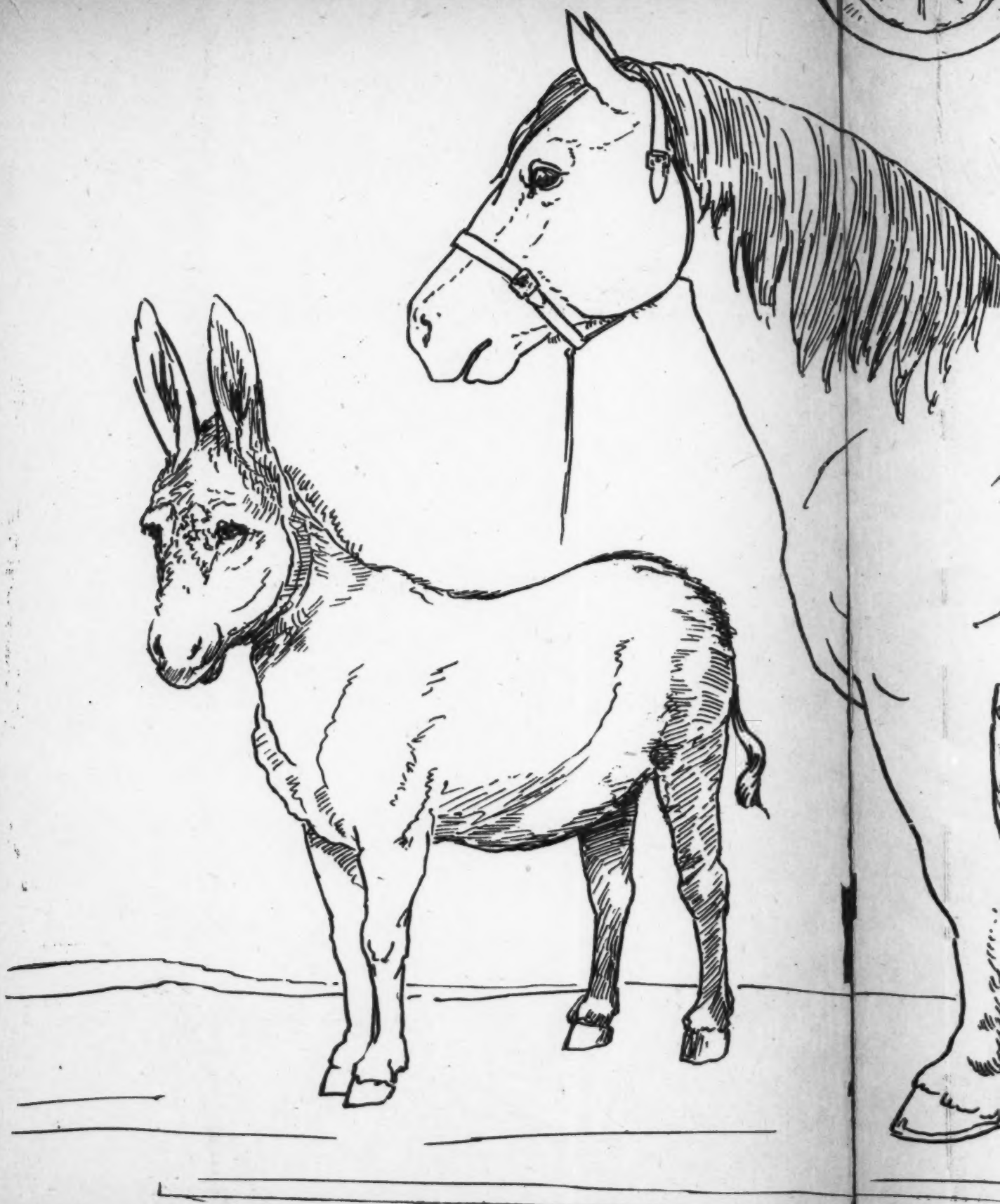
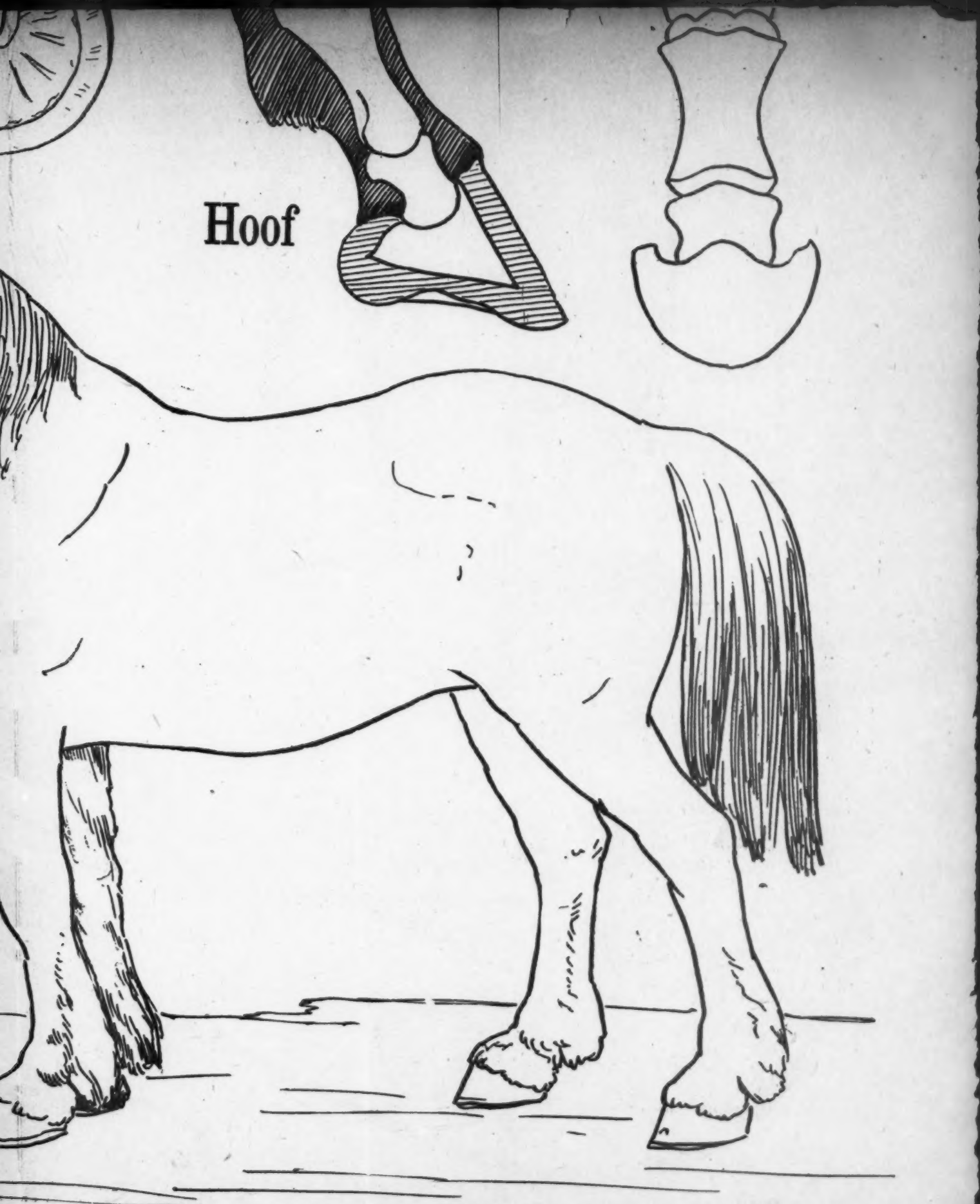


Supplement to THE SCHOOL JOURNAL, October 24, 1896.

A Study of



f the Horse.

Little Boy Blue (*blowing several blasts on his horn as he comes forward.*)—Here's little Boy Blue! I blow my horn, when sheep's in the meadow and cow's in the corn. I've brought you my very best horn for a present, Father Christmas. It's a good one, I can tell you! (*Blows again, and hands to Father Christmas, who smilingly tries the horn before handing on to Jack.*)

Contrary Mary.—"Mary, Mary, quite contrary," they call me, Father Christmas. I'm not contrary at all. Don't you believe it. Only, I *don't* like to do just the same as other folks. That's the reason I'm not going to give you one of my silver bells or my pretty shells. I'll keep them myself for the present. Perhaps when it's Fourth of July, or some other time when nobody else is thinking about giving you anything, you'll hear from Contrary Mary. (*Flounces herself away to place.*)

Mother Goose.—Fie, fie, my child! Give your presents to Father Christmas as you should. This contrariness grows upon you apace, and must be checked at once. (*Mary obeys Mother Goose, reluctantly, pointing and muttering to herself.*)

Little Tommy Tucker.—I am only little Tommy Tucker who sings for his supper. All I can give you is a song, Father Christmas:

TOMMY TUCKER'S SONG.

Air; "Ben Bolt."

Oh, don't you remember when children were old,
And money grew up on the trees,
How we lived upon nothing but cake and ice cream,
And had none but our own selves to please?
We went to bed late every night of our lives,
And we played every day all day long;
And we never did sums, and could spell anyhow,
And nobody said it was wrong!

Oh, don't you remember the naughty child grew,
The good one was good all in vain,
Till dear Father Christmas and Mother Goose, too,
To children their duty made plain?
So now we can cipher and spell with a will,
And at nine we are snug in our beds,
With good Father Christmas in all of our dreams,
And Mother Goose songs in our heads!

Father Christmas.—Bravo, Tom Tucker! Be sure you shall have the supper for which you have sung so well. Bless my eyes! Who comes here?

Jack and Jill (*together*).—We are Jack and Jill, Father Christmas. And here's a pail for you. It is the one that we had when "Jack fell down and broke his crown, and Jill came tumbling after." (*Hands pail.*)

Simple Simon (*drawling*).—Simple Simon, I am. I met a pieman, going to the fair. Says Simple Simon to the pieman, "Let me taste your fare." Says the pieman to Simple Simon, "Show me first your penny." Says Simple Simon to the pieman, "Indeed, I have not any."

Father Christmas.—So you did not get the pie? My boy, let it be a lesson to you that in this world nobody can have something for nothing.

Polly Flinders (*sobbing*).—I don't look fit to come to a party, Father Christmas, for I burnt my best dress sitting among the cinders. Please excuse me this time, and let me stay, though I have no gift.

Father Christmas.—Certainly, my dear, certainly!

Mother Goose (*severely*).—You are entirely too indulgent, Father Christmas! Polly Flinders, who sat among the cinders, ought to have stayed at home.—(*Polly begins to cry.*)

Father Christmas.—Oh, we must overlook her appearance this time, Mother Goose. Christmas is no time for tears. Go back among your brothers and sisters, Polly. Mother Goose and I will let you stay, but don't sit again among the cinders, Polly Flinders!

Sound of singing, outside. Children of All Nations enter, waving flags. At the conclusion of their song, they stand in a semi-circle behind Father Christmas and Mother Goose.

SONG OF ALL NATIONS.

(*Air:* "Upidee," Page 68, Franklin Sq. Coll. No. 1.)

Dear Father Christmas, you we greet,
Tra la la, tra la la,
And Mother Goose, his friend so meet,
Tra la la, la la.
From every nation on the earth
We hail you both with Christmas mirth.

Chorus.—Merry, merry Christmas all!
Christmas gay, happy day!
Merry, merry Christmas all!
Merry Christmas day!

(*Pointing to Mother Goose and Father Christmas.*)

"The Children's Friends," their name is known,
Tra la la, tra la la;
Oh, long may they that title own,
Tra la la, la la.
Wherever in the whole wide world
The flag of childhood is unfurled.—*Cho.*

(*Taking places.*)

Above me two most loving friends,
Tra la la, tra la la,
The banner of each nation bends,
Tra la la, la la.
Hurrah for father Christmas dear!
And also Mother Goose, we'll cheer!—*Cho.*

Enter Thanksgiving, carrying a basket of fruit, and accompanied by her children, Peace and Plenty.

Father Christmas.—Why, here's my dear niece, Thanksgiving, with her two fine youngsters Peace and Plenty! Thanksgiving, my dear, permit me to present you to Mother Goose, her son Jack, and all the rest of her family. (*Mutual recognitions.*)
Also, to the Children of All Nations. (*Bows.*)

Thanksgiving.—
With Peace and with Plenty, my children, I bring
To good Father Christmas our small offering.—(*Presents basket.*)

Peace and Plenty (*together*).—
Long live Father Christmas and Mother Goose, too!—
Their fame is world-wide, and their friends not a few.

Thanksgiving, Peace, and Plenty now take places near Father Christmas, while Happy New Year enters, carrying a bunch of keys. She is accompanied by two children, Hope and Good Resolutions.

Father Christmas (*rising to greet her*). My dear daughter, Happy New Year, we are all glad to see you, with Hope and Good Resolutions looking so bright and well. Permit me to introduce my guests. (*Mutual recognitions.*)

Happy New Year.—
With Good Resolutions quite close to my side,
And sweet little Hope with me, whate'er betide,
I bring Father Christmas the bright golden keys
That will open my door '97 with ease.

Hope and Good Resolutions (*together*).
Good cheer, Mother Goose! Father Christmas, good cheer!
We wish each and all of you, happy New Year!

Happy New Year and her children group themselves next to Thanksgiving. Enter Santa Claus, bustling about, and shaking hands with everybody, while speaking.

Santa Claus.—
What ho, Father Christmas! What ho, Mother Goose!
At last from my Christmas Eve duties I'm loose.
Not a stocking from North Pole to South but I've filled,
Books, candies, and toys by each mantelpiece spilled.
My pack is quite empty, my reindeer done out,
But on Christmas morning there'll be such a shout
From the east to the west, from the south to the north,
When their gifts from their stockings the children pull forth,
That it's worth all my trouble—that hearty good cheer,
"Hurrah! In the night Santa Claus has been here!"
But, folks, I am hungry, I freely confess,
So on to the dining-room now I will press
Roast turkey, and cranberry sauce, and mince pie,
Are there on the table, I saw passing by.

Father Christmas.—
Now Santa has come, let the banquet be shared
That for our reunion I've ordered prepared.
To the dining-room we will adjourn, Mother Goose;
(*Takes her arm*)
Come, all the rest, follow,—I'll take no excuse.
Santa Claus, lead Thanksgiving; Jack, Happy New Year,
Away now, my friends, to our good Christmas cheer!

All go out, two by two, singing the following stanza to the air of "Upidee."

All together.—
Come to the Christmas feast so gay,
Tra la la, tra la la;
Good Father Christmas leads the way.
Tra la la, la la.
Come, children, he'll "take no excuse;"
Come, follow him and Mother Goose.

Merry, merry Christmas all!
Christmas gay, happy day!
Merry, merry Christmas all!
Merry Christmas day

Little Boy Blue (*blowing several blasts on his horn as he comes forward.*)—Here's little Boy Blue! I blow my horn, when sheep's in the meadow and cow's in the corn. I've brought you my very best horn for a present, Father Christmas. It's a good one, I can tell you! (*Blows again, and hands to Father Christmas, who smilingly tries the horn before handing on to Jack.*)

Contrary Mary.—"Mary, Mary, quite contrary," they call me, Father Christmas. I'm not contrary at all. Don't you believe it. Only, I *don't* like to do just the same as other folks. That's the reason I'm not going to give you one of my silver bells or my pretty shells. I'll keep them myself for the present. Perhaps when it's Fourth of July, or some other time when nobody else is thinking about giving you anything, you'll hear from Contrary Mary. (*Flounces herself away to place.*)

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Hurrah for father Christmas dear!
And also Mother Goose, we'll cheer!—*Cho.*

Enter Thanksgiving, carrying a basket of fruit, and accompanied by her children, Peace and Plenty.

Father Christmas.—Why, here's my dear niece, Thanksgiving, with her two fine youngsters Peace and Plenty! Thanksgiving, my dear, permit me to present you to Mother Goose, her son Jack, and all the rest of her family. (*Mutual recognitions.*)
Also, to the Children of All Nations. (*Bows.*)

Thanksgiving.—
With Peace and with Plenty, my children, I bring
To good Father Christmas our small offering.—(*Presents basket.*)

Peace and Plenty (*together*).—
Long live Father Christmas and Mother Goose, too!—
Their fame is world-wide, and their friends not a few.

Thanksgiving, Peace, and Plenty now take places near Father Christmas, while Happy New Year enters, carrying a bunch of keys. She is accompanied by two children, Hope and Good Resolutions.

Father Christmas (*rising to greet her*). My dear daughter, Happy New Year, we are all glad to see you, with Hope and Good Resolutions looking so bright and well. Permit me to introduce my guests. (*Mutual recognitions.*)

Happy New Year.—
With Good Resolutions quite close to my side,
And sweet little Hope with me, whate'er betide,
I bring Father Christmas the bright golden keys
That will open my door '97 with ease.

Hope and Good Resolutions (*together*).
Good cheer, Mother Goose! Father Christmas, good cheer!
We wish each and all of you, happy New Year!

Happy New Year and her children group themselves next to Thanksgiving. Enter Santa Claus, bustling about, and shaking hands with everybody, while speaking.

Santa Claus.—
What ho, Father Christmas! What ho, Mother Goose!
At last from my Christmas Eve duties I'm loose.
Not a stocking from North Pole to South but I've filled,
Books, candies, and toys by each mantelpiece spilled.
My pack is quite empty, my reindeer done out,
But on Christmas morning there'll be such a shout
From the east to the west, from the south to the north,
When their gifts from their stockings the children pull forth,
That it's worth all my trouble—that hearty good cheer,
"Hurrah! In the night Santa Claus has been here!"
But, folks, I am hungry, I freely confess,
So on to the dining-room now I will press.
Roast turkey, and cranberry sauce, and mince pie,
Are there on the table, I saw passing by.

Father Christmas.—
Now Santa has come, let the banquet be shared
That for our reunion I've ordered prepared.
To the dining-room we will adjourn, Mother Goose;
(*Takes her arm*)
Come, all the rest, follow,—I'll take no excuse.
Santa Claus, lead Thanksgiving; Jack, Happy New Year,
Away now, my friends, to our good Christmas cheer!

All go out, two by two, singing the following stanza to the air of "Upidee."

All together.—
Come to the Christmas feast so gay,
Tra la la, tra la la;
Good Father Christmas leads the way.
Tra la la, la la.
Come, children, he'll "take no excuse;"
Come, follow him and Mother Goose.

Merry, merry Christmas all!
Christmas gay, happy day!
Merry, merry Christmas all!
Merry Christmas day

Letters.

The Standard of Value.

It is a question of interest to high school students, What is the standard of value? Some have said it is a dollar, but this is a mistake; a dollar is only a unit of account. Upon reflection, it is plain that there must be a standard of value as there is a standard in everything else that has to be measured, as length, time, weight, etc. We are constantly speaking of value—houses are valued, clothing, furniture, etc. When specie payments were suspended here in 1861, the standard of value did not change. Values were measured by greenbacks, but the greenback was measured by the standard the world has set up and recognizes, and that is gold.

In Mexico the standard of value is gold, though that is not in circulation; she only has a currency made of silver but when an article, as boots, is purchased the price is a gold price; for example, a pair of shoes that in the United States would be four dollars is there eight dollars. So in Argentina that only uses silver. This standard of value was set up so early in the history of the world that no one knows when or where it was done; nor can it be told when or where the foot measure or the pound weight originated. It may be said that the meter was originated right before our eyes, but it must be remembered that those enterprising Frenchmen who took a ten millionth part of the distance from the equator to the pole and called it a meter, measured the circumference in feet and inches; so that a meter is but a unit of length. It is the same thing with the sovereign and the dollar—they are simply units of value.

Until some twenty years ago silver was also a standard of value; both silver and gold were considered fit to represent values, but it was always subordinate and reckoned as one-sixteenth as valuable; so in reality value was measured by gold. This standard does not fluctuate. We could make a table:

One lb. sugar is worth 1½ grains gold
" bush. wheat is worth 20 grains gold
" day's wages " " 25 " "

but this would he inconvenient now; it was the plan in old times; each owner of gold carried a pair of scales and little lumps of gold This government fixed on twenty-five grains of gold as a "unit of account" that is, it struck off pieces of gold all containing just so much.

All these are interesting things to high school pupils who want to have some primary ideas about money. The bottom idea is that the standard of value has from time immemorial been gold and must continue to be.

E. E. SELBY.

Cincinnati.

AS THE SHUTTLE SWIFTLY FLIES.

KEY B-FLAT. E. A. HANCHETT.

m_1	$.s_1$	$:s_1$	$.s_1$	l_1	$.d$	$:d$	t_1	$.l_1$	$:s_1$	$.l_1$	s_1	$.m_1$	$:r_1$
1. As the	shut-	tle		swift-	ly	flies,	Back and	forth	be-		fore our	eyes,	
2. Weaving	ev-	er		day	by	day,	As the	shut-	tles		brisk- ly	play,	
3. Weaving	in	life's		bus-	y	loom,	Ming- ling	sun-	shine		with the	gloom,	
4. Broken	threads	in		life	a-	bound,	In each	sta-	tion		they are	found;	
d_1	$.m_1$	$:m_1$	$.m_1$	f_1	$.l_1$	$:l_1$	s_1	$.f_1$	$:m_1$	$.f_1$	m_1	$.d_1$	$:t_2$
m_1	$.s_1$	$:s_1$	$.s_1$	l_1	$.d$	$:d$	t_1	$.l_1$	$:s_1$	$.d$	t_1	$.r$	$:d$
Blending	with its			fing- ers		light,	Warp and	woof	till		they u-	nite	
Brok- en	threads how			oft an-		noy	And our	pre- cious			time em-	ploy;	
Warp and	woof of			deeds we		blend,	Till life's	fab- ric			has an	end;	
May faith's	kind and			friend-ly		hand,	Help us	to	ad-		just the	strand,	
d_1	$.m_1$	$:m_1$	$.m_1$	f_1	$.l_1$	$:l_1$	s_1	$.f_1$	$:m_1$	$.m_1$	r_1	$.f_1$	$:m_1$
d	$.t_1$	$:l_1$	$.d$	t_1	$.l_1$	$:s_1$	s_1	$.d$	$:t_1$	$.d$	r	$.m$	$:r$
In a	fab-	ric		good and		strong,	Let us	hear	the		weav- er's	song,	
Warn- ing	us	by		sharp re-		proof,	We must	watch	the		warp and	woof,	
Brok- en	threads how			oft we		find,	Bur- den-	ing	the		no- ble	mind,	
That when	life's last			tide shall		ebb,	There will	be	a		per- fect	web,	
m_1	$.s_1$	$:f_1$	$.l_1$	s_1	$.f_1$	$:m_1$	m_1	$.m_1$	$:s_1$	$.m_1$	s_1	$.d$	$:t_1$
m_1	$.s_1$	$:s_1$	$.s_1$	l_1	$.d$	$:d$	t_1	$.l_1$	$:s_1$	$.d$	t_1	$.r$	$:d$
In a	fab-	ric		good and		strong,	Let us	hear	the		weav- er's	song.	
Warn- ing	us	by		sharp re-		proof,	We must	watch	the		warp and	woof.	
Brok- en	threads how			oft we		find,	Bur- den-	ing	the		no- ble	mind.	
That when	life's last			tide shall		ebb,	There will	be	a		per- fect	web.	
d_1	$.m_1$	$:m_1$	$.m_1$	f_1	$.l_1$	$:l_1$	s_1	$.f_1$	$:m_1$	$.m_1$	r_1	f_1	$:m_1$

LITTLE FAIRY.

KEY A. D. BATCHELLOR.

$:m_1$	$.f_1$	s_1	$:m$	$:r$	$.d$	t_1	$:l_1$	$:-$	s_1	$.d$	$:t_1$	$:d$	r	$:-$
1. Little		fai- ry,		do not		tar- ry,			Tripping o'er			the	lea;	
Free from		sad- ness,		smiles of		glad- ness,			On thy hap-		py	face;		
$:d_1$	$.r_1$	m_1	$:s_1$	$:f_1$	$.m_1$	r_1	$:f_1$	$:-$	m_1	$.m_1$	$:r_1$	$:m_1$	s_1	$:-$
$:m_1$	$.f_1$	s_1	$:m$	$:f$	$.m$	r	$:l$	$:-$	s_1	$.l_1$	$:t_1$	$:r$	d	$:-$
Coming		fleet- ly,		singing		sweet- ly,			Welcome thou			shalt	be;	
Richest		trea- sure		bringeth		plea- sure			To thy dwell-		ing	place;		
$:d_1$	$.r_1$	m_1	$:s_1$	$:l_1$	$.s_1$	f_1	$:f_1$	$:-$	m_1	$.f_1$	$:s_1$	$:f_1$	m_1	$:-$
$:d$	$.t_1$	l_1	$:d$	$:t_1$	$.l_1$	s_1	$:-$	$:d$	$.r$	m	$:d$	$:t_1$	$.d$	r	$:-$
Where the		flow- ers		love to		dwell,		In the		cool	and	shady		dell,	
May you		ev- er		happy		be,		Living		by	the	foamy		sea;	
$:m_1$	$.s_1$	f_1	$:l_1$	$:s_1$	$.f_1$	m	$:-$	$:m_1$	$.f_1$	s_1	$:m_1$	$:s_1$	$.l_1$	t_1	$:-$
$:m_1$	$.f_1$	s_1	$:m$	$:f$	$.m$	r	$:l_1$	$:-$	s_1	$.l_1$	$:t_1$	$:r$	d	$:-$
Do not		tar- ry,		lit- tle		fai- ry,			Tripping o'er			the	lea.	
Do no		tar- ry,		lit- tle		fai- ry,			Tripping o'er			the	lea.	
$:d_1$	$.r_1$	m_1	$:s_1$	$:l_1$	$.s_1$	f_1	$:f_1$	$:-$	m_1	$.f_1$	$:s_1$	$:f_1$	m_1	$:-$

The Tonic Sol-Fa System of Music.

As an example of the ease with which the Tonic Sol-fa notation may be read by any class of school children, a school song in two-parts is here shown in that dress. The tones are indicated by the initial letters of the ordinary syllables applied to these, except that it has been found needful to change the name of the seventh of the scale from "si" to "te" in order to obtain a different initial for each note, but the same letters indicate the same scale tone, no matter what the key may be; thus "d" always means "doh," "r" always means "ray," etc., the different keys being stated in plain English in all cases.

It should be further explained that the measures are shown by vertical lines, and the parts into which the measures are divided are shown by colons. Periods are used when any beat is equally shared by two notes, and dashes to indicate the continuance of the preceding sound through any of the other divisions. The line at the bottom right corner of some notes, indicates the lower octave. These signs retain their significance under all circumstances.

That this method of teaching is making steady progress throughout the country, is shown from the ever increasing number of letters asking for advice and help, which are received by Mr. Tagg the corresponding secretary of the "American Tonic Sol-fa Association and College of Music" which has its headquarters in New York. A large quantity of music and teaching apparatus in this method, has been published by the Biglow & Main Co., the Ditsons, and by Novello, Ewer & Co., and the attention of musicians all over the country is being given to it to a much greater extent than ever before. Particular information, and advice as to starting this method in schools may be had at any time by applying to the secretary of college Mr. John Tagg, 76 Cranberry street, Brooklyn.

Books.

A revised edition of Isaac Pitman's *Complete Phonographic Instructor* has just been issued. It is hardly necessary to speak in praise of a system that has received such wide endorsement as has this of Sir Isaac Pitman It was the first of the modern systems and it is undoubtedly the best to-day. For simplicity, scientific accuracy, and adaptability to the wants of reporters of different kinds it will stand the test every time. *The Complete Phonographic Instructor* contains instruction in both the corresponding and reporting styles, with copious lists of phrases and exercises, business letters, and specimens of legal forms. The general plan of the *Instructor* makes it equally acceptable for self-tuition and for class use. A chapter entitled "Practical Hints in Legal Work," from the pen of Mr W. L. Mason, principal of the Metropolitan school of Isaac Pitman shorthand, 156 Fifth avenue, N. Y., is a prominent feature of the book. This book contains over 16,000 actual shorthand cuts—more than double the number to be found in any similar work. (Isaac Pitman & Sons, 33 Union Square, N. Y. 252 pp. $1.50.)

A few years ago it was a common practice for teachers to assign a certain number of pages of whatever historical text-book happened to be in use as a lesson, and the pupils familiarized themselves with that. The one that had the best memory of words and could repeat page after page of the text was generally considered the best pupil There was very little attempt to elicit thought or discussion; the author's errors and prejudices were accepted unquestioned. A better mode of teaching is now largely followed—the topical An aid to this has appeared in a little book by Prof. Jesse Lewis, of the Warrensburg. (Mo.). normal school, called *A Topical Analysis of United States History*. This book presents all the important topics to be considered from the discovery of America up to the present time with suggestive skeletons and references to school histories and other books. It is not necessary to have all of these books to pursue the plan successfully; a large share of them, however, ought to be in every school library The book leaves a large latitude for the teacher,and the pupil under this plan will acquire a better idea of historical events than by the single text-book plan. The value of this little book as a school-room aid is great. (A Flanagan, Chicago)

In *A Brief History of the English Language*, Prof. Oliver Farrar Emerson has condensed the main features of his larger work for the benefit of those who do not care to or are not prepared to go into the minute details. The general heads—English and other languages, the standard language and the dialects, the English vocabulary, changes in the form of words, and the history of English inflections—show the scope of the work. The author has made it as popular as the scientific nature of the subject permitted. Those who wish to know the growth of our language can obtain a good idea of it from this well arranged and compact volume. (The Macmillan Co., New York. $1.00.)

To keep in mind a book charmingly suitable as a New Year's gift one must note down the name *A Daily Thought for a Daily Endeavor*. On each page, which is devoted to a day in the year is gathered an inspiring verse from Scripture followed by poetical and prose extracts—a morning lesson of courage and good cheer. The compilers are Eleanor and Eliza Sutphen, and their efforts cover a wide range of devotional literature. Aside from its value on the home table, it appeals to that large body of Christian Endeavor workers as a refreshing help in their line of thought. (Baker & Taylor Company, New York. Price $1.25.)

In *Little Page Fern* (by Mrs. Alice Wellington Rollins) a collection of verses for children, appear, some of them old friends remembered in the magazines and weeklies. A characteristic which many of our readers will be glad to have their attention called to is their suitability for recitation in primary school-rooms. Each poem embodies some quaint conceit, with a little lesson deftly woven in. *The Finding of the Gentian* is the story that gives the title to a collection of short stories by the same writer. The sentiment that surrounds this late-appearing flower, whose color is "heaven's own blue," renders Mrs. Rollins' book one of peculiar interest which its pleasant tales fully sustain. (Published by the author at Bronxville, N Y. Price of each, $1.50.)

THE SCHOOL JOURNAL.

Established 1870. Published weekly at $2.50 per year, is a journal of education for school boards, superintendents, principals, and all teachers who desire to have a complete account of all the great movements in education.

We publish THE TEACHERS' INSTITUTE, monthly, $1.00 per year; THE PRIMARY SCHOOL, $1.00 a year; EDUCATIONAL FOUNDATIONS, $1.00 a year; and OUR TIMES (Current Events), monthly, 30 cents a year.

E. L. KELLOGG & Co., 61 East Ninth street, New York.

Interesting Notes.

A new illuminating gas made from petroleum has been produced in Germany, which, it is asserted, can be supplied of a quality equal to the best existing photometric standard at a cost of twenty-five cents a thousand feet. The generative plant is simple; one able to keep up a hundred lights can be built for $150.

A thought-weighing machine has been invented by Prof. Mosso, an Italian physiologist, the rush of blood to the head turning the scale. The machine is so delicate that it can measure the difference in the exertion needed to read Greek from that required for Latin.

An antiquarian interest is added to this year's pilgrimage to the famous shrine of Sant' Iago de Compostella, by the pilgrims singing once more the twelfth century hymns which the mediæval pilgrims used to chant. The Pope's Nuncio, with Cardinal Sancha, Archbishop of Valencia, and Cardinal Cascajares, Archbishop of Valladolid, will take part in the pilgrimage.

M. Moissan states in the *Annales de Clinic et de Physique* that the most stable compounds known to science disappear in the electric furnace. The only exceptions are the perfectly crystallized borides, silicides, and carbides discovered by him. These, he thinks, probable are original constituents of the globe and must still exist in some of the stars.

While Emperor Francis Joseph, of Austria, was visiting Bucharest after the formal opening of the Iron Gates of the Danube canal, he bestowed on Queen Elisabeth, of Roumania (Carmen Sylva), the Order of Merit for science and art.

Commander Henry James, of the Royal Navy, who is now 97 years of age, is about to publish his reminiscences. When he entered the navy the senior officer was Admiral of the Fleet Sir Peter Parker, who had served under officers that had fought at Cape La Hogue in 1692, three lives thus covering the period between the accession of William III. and the sixtieth year of Queen Victoria's reign.

Sir H. H. Kitchener's promotion to the rank of major-general, on account of his success at Dongola, is an unusual one, as, though he held the brevet rank of colonel, he stood tenth from the top in the list of majors of the Royal Engineers. He passes over the heads of eighty-nine colonels, eleven of whom are temporary major-generals. He is 46 years of age, and counts twenty-five years' service in the army.

Ostend is to have a new system of docks, extending a couple of miles inland and including dry docks, on which $15,000,000 will be spent. The money is contributed partly by the town and partly by the Belgian government.

Axim, on the African gold coast, must have a very large population. The natives have the pleasant custom of putting to death the tenth child in every family. The local authorities assert that thousands of children are destroyed on account of this superstitious practice, but that the influence of the fetish priests is so great that only stringent legislation can stop the slaughter.

Thirteen Inches of Wood Pierced by a Sword Fish.

A swordfish jabbed a hole through the hull of the barkentine *Irmgard* while on her recent trip from Honolulu with a cargo of sugar. The fact of the vessel being attacked by the sea monster was not discovered until yesterday.

The officers were making an inspection of the barkentine's hull when they discovered about two inches of the weapon of the fish protruding from the planks of the vessel a few inches above the water line as she lay in the stream with her hold empty. When loaded the spot where the swordfish struck would be about four feet below the surface of the water. The horny sword has broken off and about two inches of it remains out from the vessel's hull. The fish had attacked the barkentine with such force that it had driven its sword through the five-inch plankings of the vessel on the port bow and through the eight-inch skin planks immediately inside, or through thirteen inches of solid Oregon pine.

The point of the broad, flat sword protruded about an inch into the vessel's hold. The planks had split along the grain for about a foot on each side of where the fish's sword had been forced through the vessel's hull, and it was through the cracks that the water found a way into the hold.

The attacks of swordfish on vessels that ply the southern seas are not uncommon, but it has been seldom recorded that vessels have had holes bored through their hulls by the sea tigers so as to cause them to leak. The crew of the vessel do not know just when the attack was made on the *Irmgard*, but they think that it was while in about latitude 39° north and longitude 145° west, while the barkentine was plunging in a heavy head sea. Otherwise the men say they could have felt the shock of a blow severe enough to pierce thirteen inches of the tough timbers that make up the vessel's hull. A few hours after the storm, water was discovered in the barkentine's well. The vessel leaked during the remainder of the voyage, and only stopped when the point where the hull was shattered rose above the water line as the cargo was being taken from her hold. Capt. Schmidt proposes to have the pieces of the timber that were pierced by the sword removed from the vessel and mounted as an ornament for his cabin.—*San Francisco Examiner.*

A Spanish diver has succeeded in bringing $20,000 worth of silver bars from a depth of 168 feet, off Cape Finisterre. The steamer *Skyro*, which sank nine miles south of the cape five years ago, had eighty-eight bars of silver, worth $45,000, on board. The diver, whose name is Angel Erostarbe, has gone down twenty-seven times this summer and brought up thirty-seven of the bars. The work is made dangerous by the exposed position of the wreck and the strong currents.

In 1895 the British railroads carried 929,770,909 passengers, exclusive of commuters, an increase of 18,500,000 over the previous year. There were 1,024 persons killed, of whom 83 were passengers, and 4,021 wounded. The proportion of passengers killed to those carried is one in 11,000,000, and that of passengers wounded one in 840,000.